

THE IRON AGE

A Review of the Hardware, Iron, Machinery and Trades.

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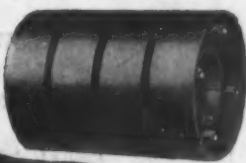
New York, Thursday, June 29, 1905.

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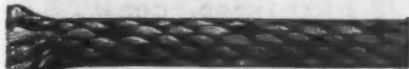


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Ad Page 25.



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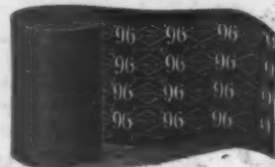
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PAGE 24.



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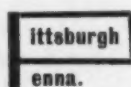
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THE IRON AGE

New York, Thursday, June 29, 1905.

New Brown & Sharpe Automatic Gear Cutting Machine.

The No. 12 automatic gear cutting machine is an entirely new design of the Brown & Sharpe Mfg. Company, Providence, R. I., and has features radically different from those heretofore applied to machines of the same character. A constant speed drive is employed, taken direct from the countershaft to the machine driving pulley. Variable cutter feeds and spindle speeds are obtained through a gear mechanism very similar to that of the Brown & Sharpe vertical milling machine, which was described in detail in *The Iron Age* February 23, 1905. An important improvement is the driving of the cutter spindle by a Renold silent chain, which does away with two pairs of worm gears and a cross shaft and permits the end movement of the cutter spindle for centralizing the cutter. The drive for returning the cutter

range of the change gear mechanism, and the exterior view of the case indicates, without need of description, the manner in which the gears are manipulated.

The driving pulley is driven at 300 revolutions per minute by a single 1¼-inch belt. When motor drive is employed a sprocket is usually substituted for the pulley. The power is delivered to a shaft carrying two long pinions, one for the speed, the other for the feed. The group of cutter speed gears is shown at A, in the right hand view, Fig. 2, the five gears of the cone, with a quill gear, giving ten changes of speed, ranging in geometrical progression from 30 to 175 revolutions per minute. The feed change gears are shown at B. A quill gear doubles the six changes effected by the cone of gears, giving 12 feeds, ranging also in geometrical progression from ¼ inch to 5 inches per minute. It will be seen that the cutter feeds are independent of the spindle speeds. At

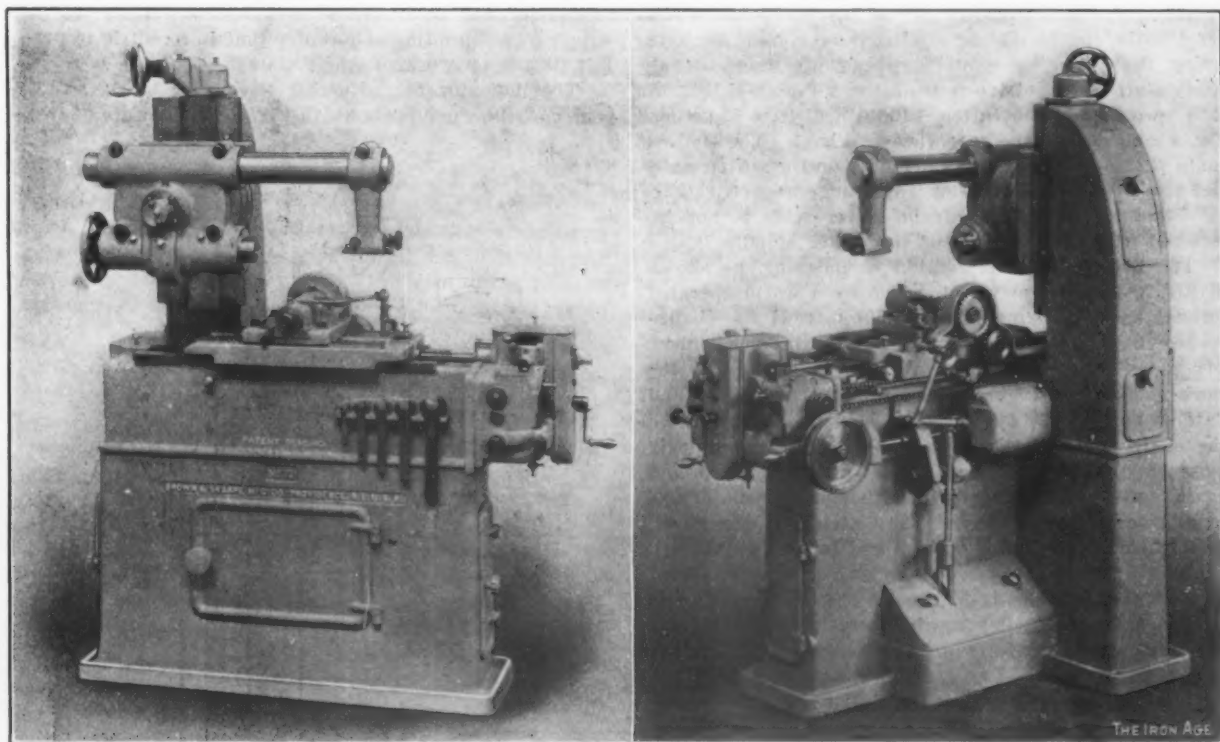


Fig. 1.—Front and Rear Views of the New Brown & Sharpe No. 12 Automatic Gear Cutting Machine.

slide is controlled by positive clutches and is independent of the speed and feed of the cutter, so that the quick return remains constant irrespective of the nature of the work to be performed. Another new feature is in the work spindle head, which can be completely revolved, allowing either end of the work spindle to be used and adapting the machine for the cutting of all kinds of bevel gears. The machine is intended for the lighter class of spur and bevel gear cutting, its capacity being gears up to 12 inches diameter and 8 inches face, with a 10 diametral pitch for cast iron and 12 diametral pitch for steel.

In appearance the machine resembles a modified milling machine in which the positions usually occupied by the cutter and work are reversed, the latter being carried by parts supported from the column, while the cutter is mounted on a slide traveling on the bed.

Front and rear views of the machine are shown in Fig. 1, and front and back views of the box containing the cutter feed and cutter speed varying mechanism in Fig. 2. The latter show very clearly the compact ar-

range of the pulley shaft is a spiral gear meshing with another on a shaft, D, at right angles with the pulley shaft. Each end of this shaft D carries a sprocket, the inner one connecting with a sprocket on the index driving shaft on the side of the machine, as shown at C, Fig. 3, and the outer one with the quick return mechanism to the cutter slide. Through the sprocket mounted directly on the feed screw the quick return is always constant, irrespective of the speed and feed of the cutter. The cutter slide is fed by the screw G, Figs. 3 and 4, the screw being driven by a worm wheel in the feed case on the end of the bed.

Fig. 4 gives a detail of the rear side of the bed, as shown in the right hand view in Fig. 1, and indicates the arrangement of the cutter slide and spindle mechanism. The cutter spindle is of tool steel, hardened and ground, and is mounted adjustably for wear in a head which can be adjusted on the cutter slide for different positions of work. A removable outer bearing on the spindle head gives additional support to the spindle. It can be rigidly clamped in position or easily removed for

changing cutters. The spindle is driven by a Renold chain, which is peculiarly applicable, as the drive is from one parallel shaft to another without turning corners as in the old way, where two pairs of worm gears and a cross shaft were employed. The new arrangement

rest is provided, which can be fastened to the frame of the machine directly back of the rim of the gear in front of the cutter to afford support when cutting spur gears. The overhanging arm carries an arbor support that will swing any work within the capacity of the machine. The

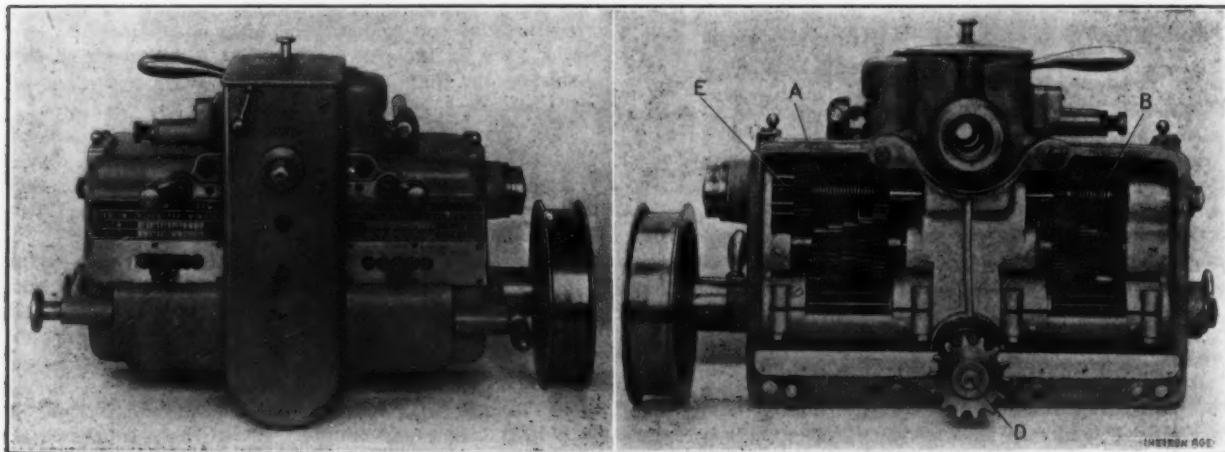


Fig. 2.—Front and Back Views of the Box Containing the Feed and Speed Changing Gears.

permits the end movement of the cutter spindle for centering the cutter, a very important advantage, as already stated. The drive is from the sprocket E, Fig. 2, to a sprocket on the cutter spindle, which is shown in Fig. 4 and also in the rear view in Fig. 1. The endless chain passes over two idlers mounted on the cutter slide, and also over a chain tension adjusting sprocket, F, Fig. 4. Thus the movement of the cutter slide is not interfered with by the drive of the cutter spindle.

The work spindle is rotated in indexing, as shown in Fig. 3, by a worm wheel driven by a worm operated through bevel gears, and the vertical shaft H and change gears, which are connected with the indexing mechanism. The index wheel and worm are entirely inclosed in the work spindle head, thus being protected from dust and liability to injury. The worm is held in its bearing on the shaft by a friction clutch, N, and can be quickly loosened to allow the work to be turned by hand and again locked without disturbing the adjustment of the work arbor or the indexing. The clutch N is disengaged by slackening the small screws O and turning the knurled knob P. Means are provided for taking up end thrust of the worm and backlash between the worm and worm wheel. The worm being continuously in mesh with the wheel avoids the bruising of either when they are put in operation.

The indexing mechanism is of the well-known type adopted by the Brown & Sharpe Company. It is positive in its action, and as the locking disk can be set to make more than one turn the mechanism is relieved from heavy strains when indexing for small numbers of teeth. The drive for the indexing mechanism, as shown before, is independent of the cutter drive and feed, so that a constant and rapid indexing is possible irrespective of the feed or speed of the cutter.

The spindle head is adjustable on the upright column of the machine and is controlled by an elevating screw operated by a hand wheel at the top of the upright. The thrust is taken on ball bearings. A dial graduated to thousandths of an inch indicates the movement and greatly facilitates the setting of the blank for depth of cut. Both ends of the work spindle are bored with a standard taper hole to permit the use of either end, and a straight hole extends through the spindle connecting the tapered bores. The hand wheel at one end of the spindle is used to release the friction clutch and allow the spindle to be turned by hand when truing up work. The friction clutch is shown at M, Fig. 5, the spindle being disengaged from the worm wheel when it is desired to use the hand wheel. For very fine adjustment in resetting work or for rotating the spindle when bevel gears are being cut the worm is disengaged from its shaft by the friction clutch N, Fig. 3. An adjustable

support has an adjustable center that is eccentric to permit its use on work of small diameter.

The indicator for adjusting the cutter to the exact center of the work is shown in Fig. 6. It consists of two

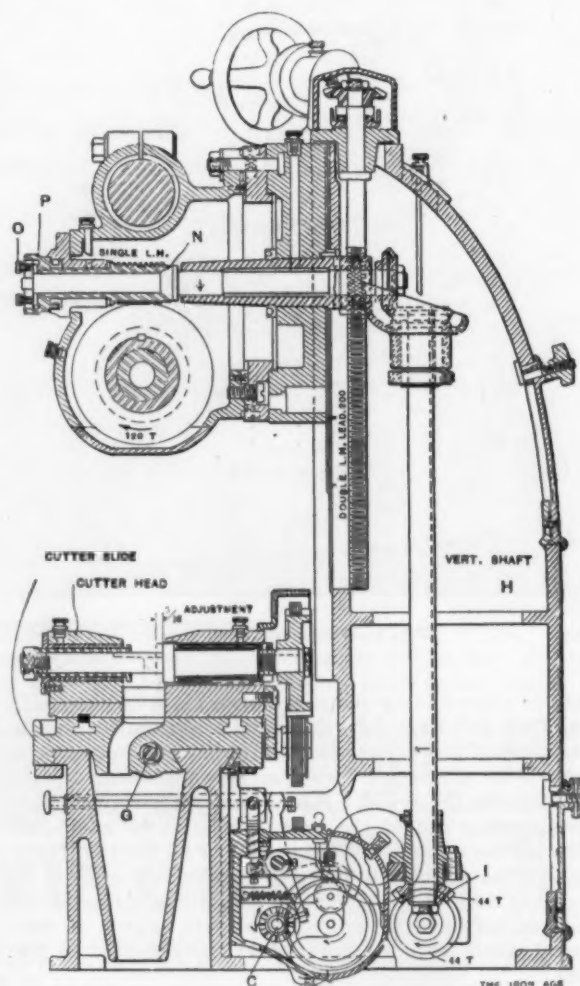


Fig. 3.—Sectional Elevation of the Machine Above the Base.

pivoted fingers, the outer ends of which magnify the slightest movement of the inner ends. The inner ends are brought to bear against the cutter as near the pitch line as possible, and if the cutter is central the outer ends of the fingers indicate equal readings from the zero mark on the graduated plate. The illustration shows

the means of testing the accuracy of the indicator. A test plug is inserted in the end of the spindle and the inner ends of the fingers are brought to bear upon it. If the outer ends of the fingers do not read correctly on the graduated plate the error may be corrected by readjusting the inner ends of the fingers.

Figs. 7 and 8 show the setting of the machine for two

The Australian Farm Implement Trade.

MELBOURNE, May 10, 1905.—Very interesting evidence was a few days ago brought before the Tariff Commission by the Australian makers of farm implements and harvesting machines. Local manufacturers certainly have not had any sympathy shown them by the members

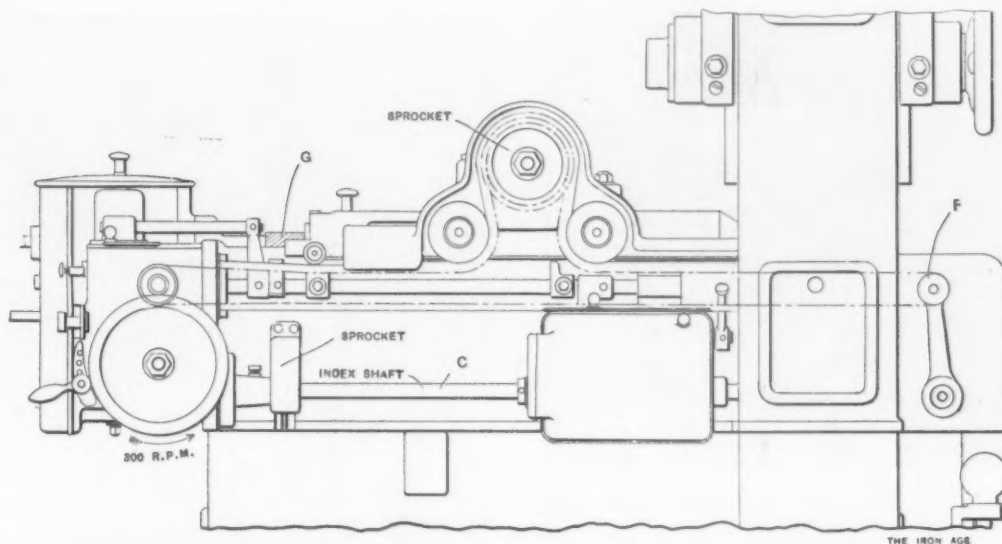


Fig. 4.—Detail of the Bed from the Rear as Seen in the Right Hand View of Fig. 1.

operations of bevel gear cutting. The first shows the cutting of a small bevel gear of machinery steel with 24 teeth, 20 pitch. Fig. 8 shows the cutting of a bevel gear with a long hub on the inside and indicates the advantage of being able to swivel the head either way, as this gear could not be cut with the machine set as in

of the Tariff Commission, but have succeeded in stating a very strong case in favor of increased duties against American manufactured goods. There is not the slightest doubt that the International Harvester Company of America has adopted rather unusual means to further its sales at the expense of the local article. The exports of agricultural implements from America to Australia in 1902 were \$1,065,000; in 1903, \$1,558,000; in 1904, \$1,436,000, and it is claimed that, with a protective tariff, these goods could have been manufactured here to

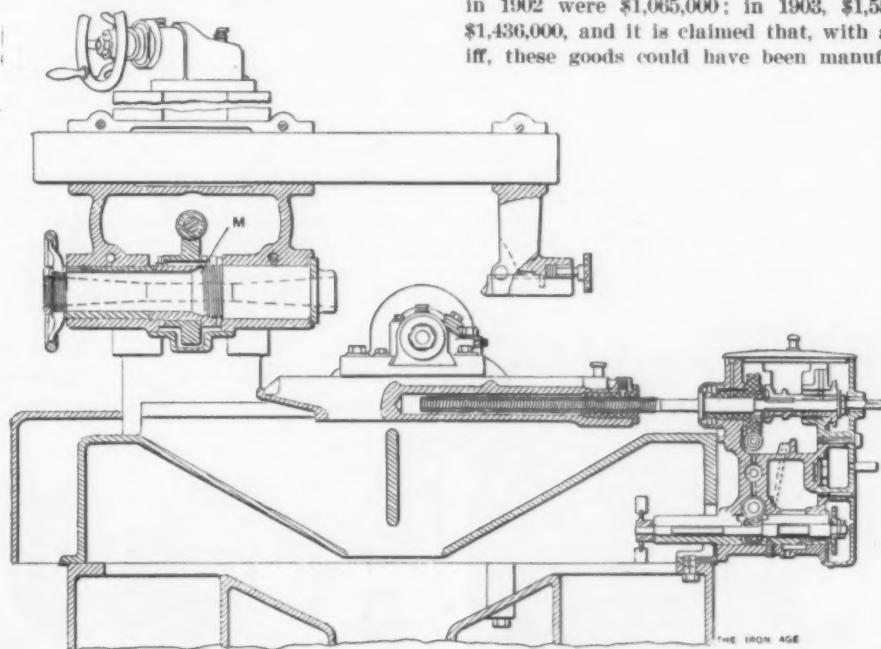


Fig. 5.—Sectional Detail of the Bed and Column from the Opposite Side.

Fig. 7. Fig. 9 gives a few examples of work done on the gear cutter, illustrating the latitude in range.

The machine occupies a floor space of 30 x 58 inches and weighs about 1725 pounds.

The Newport News Shipbuilding & Dry Dock Company, Newport News, Va., will shortly begin the construction of a new dry dock 700 feet long and large enough to accommodate large war ships. It is understood that other extensive improvements to the yards will also be made.

the advantage of the consumer, the manufacturer and the employee alike.

H. V. McKay, our largest local manufacturer, gave evidence of one of the North American firms endeavoring to pass through a shipment of stripper harvesters on an invoice value of £26, and of another North American firm having got the machines through the customs at a valuation of £38 2s. 6d., the retail prices in each case being from £81 to £99. The duty on these machines in Australia is 12½ per cent. only, while binders are duty free.

On the other hand, the duty in the United States against Australian made stripper harvesters is 45 per cent. ad valorem, and the freight, which is heavier from Australia to America than from America to Australia, combined with the high duty, puts any attempt to export to the United States out of the question. Mr. McKay, therefore, sought a fixed duty of £25 at least on each imported harvester, and 2½ pence per pound on

does seem as if the company, if it intends to hold the Australian market, will have to come here and manufacture. Public feeling is running pretty high on this harvester question, and an increased duty will surely be insisted on shortly.

The West Virginia Board of Trade was organized at Wheeling on June 20 at a convention of delegates repre-

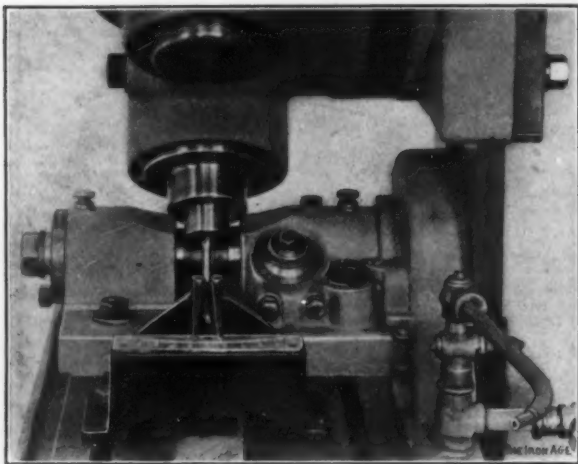


Fig. 6.—Indicator for Centering Cutters, Showing Its Test for Accuracy.

extra parts. This would stop foreign importations and compel the American company to establish its own works in Australia, thus giving employment to local artisans and helping to develop our coal and iron resources. Competition of this kind he would not object to.

In the course of his evidence Mr. McKay affirmed that, according to the invoices of the International Harvester Company supplied to the customs department,

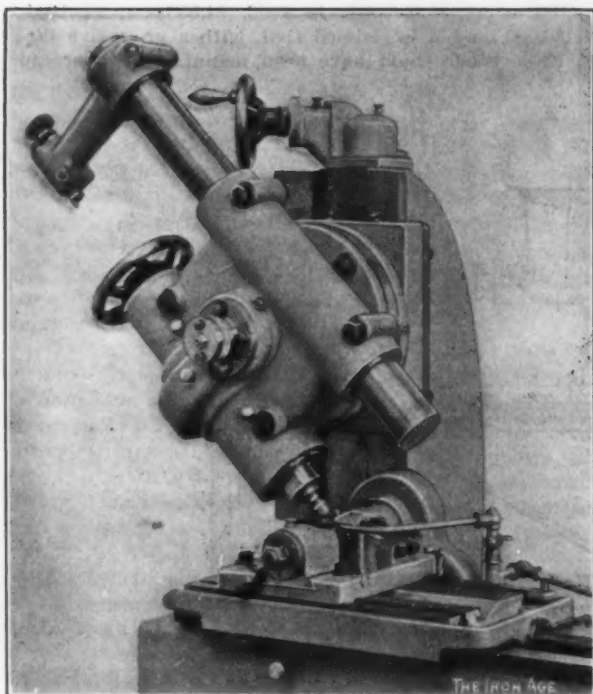


Fig. 7.—The Setting for Cutting a Small Bevel Gear.

the selling price of stripper harvesters in highly protected America is £26, in moderately protected Australia, £85, and in nonprotected Argentine, £140. Mr. McKay claims that he paid in wages last year as much money as the whole of the American firms paid in duty to the customs. One or two Australian papers have commented on the erection of the new building of the Osborne branch of the International Harvester Company in Melbourne, and judging from present indications it

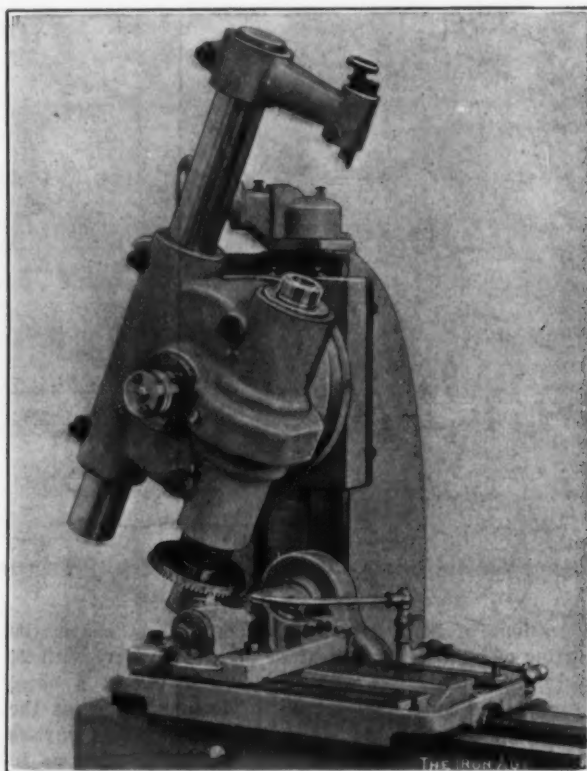


Fig. 8.—The Setting for Cutting a Bevel Gear with a Long Hub on the Inside.

senting nearly every industrial and commercial body in the State and held under the auspices of the Wheeling Board of Trade. Hon. Geo. C. Sturgiss of Morgantown was elected president; Frank W. Clark of New Martinsville, Howard Sutherland of Elkins, Charles Capito of Charleston, George W. Summers of Parkersburg and J. W. Ruff of Bluefield, vice-presidents; R. B. Naylor, secretary of the Wheeling Board of Trade, secretary, and C. A. Weaver of Moundsville, treasurer. The next meeting will be held in Wheeling in October.

The Crane Company has moved its general offices and sales departments to its new office building, 519 South

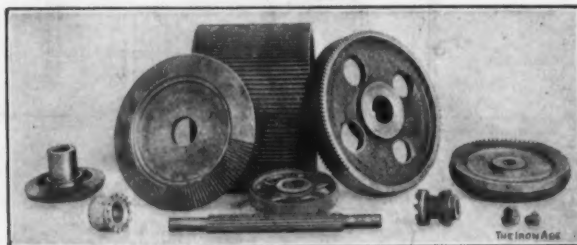


Fig. 9.—The Range of Work of the New Brown & Sharpe Gear Cutter.

Canal street, near its Judd street plant, Chicago. The former location of the general offices, 10 North Jefferson street, had been used by the company since 1864, and a branch of the city sales department will be continued at that address for the convenience of many customers. In the new building the company will have five floors of entirely open offices, which will provide ample space for the proper transaction of its business.

The Pig Iron Warrant.

After many years of exhaustive study of existing systems, and as the result of extended experience of its own, the American Pig Iron Storage Warrant Company, 44 Wall street, New York, has worked out methods which cover every possible contingency. Through the writings and addresses of its able advocate, George H. Hull, president of the company, the American iron trade is thoroughly familiar with the aims and the claims of iron storage, but comparatively few are acquainted with the details of the issue of warrants or the safeguards which have been

receipt states where the iron is stored, and guarantees that on its surrender the iron described will be delivered free on board cars. Iron received into the warrant yard is weighed and graded both by the furnace company and by the warrant company. All iron which does not come up to the standard is rejected and must be replaced by iron which does.

The furnace company fills and signs the blank B. Fig. 2, addressed to the storage company, a reproduction of such an order being appended. This is forwarded, together with the yardmaster's certificate, to the warrant company.

Upon receipt of the blanks A and B, Figs. 1 and 2,

THIS CERTIFICATE IS NOT NEGOTIABLE.

No. 8030

American Pig Iron Storage Warrant Company,
NEW YORK CITY.

GENTLEMEN:

THIS IS TO CERTIFY

FIRST, That I have received into the American Pig Iron Storage Warrant Company's Yard No. 74 Located at North of Steel No 74 Pig Iron and entered same in the Company's books for said yard, in the name and subject to the order of W. H. Hull

SECOND, That said Iron is piled in a neat and orderly manner, and marked plainly as follows: 100 - 74

THIRD, That I have examined the Iron and that it is fully up to the grade named above.

FOURTH, That in weighing said Iron into the Yard, which was done under my personal supervision, an allowance of 28 lbs. per ton extra weight was made, which in my judgment, is sufficient to ensure the Iron weighing out fully 240 lbs. to the ton.

FIFTH, That as Warehouseman and Yardmaster of this Company, I will guarantee the safe custody of all Iron under my care, and will deliver no Iron from said yard until a Certificate for same has been returned to me with an endorsement for delivery, signed by the Trust Company and by the President and Secretary of the Warrant Company, when I will immediately and before moving the Iron cancel the Yardmaster's signature and at once forward the cancelled certificate to the New York Office of the Company.

[Signature]
Warehouseman and Yardmaster.

6/30 1904
NOV 14 1904

Fig. 1.—Blank A.—Yardmaster's Certificate.

worked out to protect the holder. An account of the method of procedure in issuing a warrant and in taking out the iron from the warrant yard may therefore be of general interest.

Taking Out Warrants.

When a furnace company desires to put a certain quantity of pig iron into warrant yard the iron is delivered to the nearest yard of the American Pig Iron Storage Warrant Company, and for each 100 tons the sworn yardmaster issues a certificate of the form shown in the accompanying reproduction, designated as blank A, Figs. 1, 2 and 3. The iron is weighed by the yardmaster and it is graded, and each certificate for 100 tons of iron, reciting, as shown, the grade and the quantity, is delivered duly signed to the furnace company. The yardmaster's

properly executed, a warrant is filled up and signed by the president and by the secretary of the warrant company. The three documents are then taken to the trust company, which cancels the blank A with the cancellation shown in *fac-simile* in Fig. 3.

The trust company will not sign the warrant to be issued unless it has in its possession the yardmaster's certificate and the furnace company's delivery order, nor will the trust company register the warrant unless it has four signatures—those of the yardmaster, the furnace company and of the two officers of the warrant company.

The blanks A and B remain in the possession of the trust company so long as the public has the outstanding warrant. Simultaneously with the cancellation and the filing of the blanks A and B the trust company registers

and signs the warrant and returns it to the storage company, which then delivers it to the person for whom it was issued and to whose order it is made. Figs. 4 and 5 show a *fac-simile* of a warrant and its indorsement.

Originally the warrant issued did not refer to the identical parcel of iron on which it had been issued, but merely to a like quantity of iron of the same grade, in the same yard. The warrant itself, under the present system, has no identification mark, but the Storage Company and the trust company, by their records, can identify each warrant with the exact pile of iron for which it was issued, and that pile of iron is held so long as the war-

The warrant is then taken to the trust company, which cancels its signature and delivers it back to the warrant company with the yardmaster's certificate, Figs. 1 and 3. This is stamped on the back with the following cancellation, as shown in Fig. 3:

NEW YORK.....18..

Warrant No..... issued as above, having been this day canceled, the iron covered by the within certificate is hereby released for delivery to the holder thereof, on presentation and surrender of said certificate to the yardmaster, at the yard from which it was issued.

....., Registrar, F. L. & T. Company.

....., Secretary, A. P. I. S. W. Company.

....., President, A. P. I. S. W. Company.

No. 4425

FILE 259-74

RECEIVED JUN 29 1905

American Pig Iron Storage Warrant Co.
NEW YORK CITY.

GENTLEMEN:

We have this day delivered into your Storage Yard No. 24

located at North Ogden in the State of Utah

Five Hundred Tons

of Bessemer, Two Soft Pig Iron

as per your Yardmaster's Certificate, Nos. 8026 to 8030 inclusive

which we enclose herewith duly signed.

Please issue Warrants to cover same to the order of

Chas. C. Wheeler

and send Warrants by Messenger to

Bank of America

New York City

Enclosed we hand you check for \$ to cover Warrant.

Fee (25 cents per ton on tons), \$

Loading deposit (cents per ton on tons), \$

Total, \$

By J. M. Morris

Treas.

Fig. 2.—Blank B.—Furnace Company's Delivery Order.

rant is in circulation until the identical warrant is canceled.

Of course the warrant after being registered by the trust company and indorsed by the person to whose order it is issued may be passed from hand to hand, carrying the title to the iron which it covers to each owner.

Warrants call for storage at the rate of 2½ cents per ton per month. Each seller is expected to deliver it to the buyer free of accrued storage or to deduct the accrued storage charges from his bill.

Withdrawing the Iron.

The course of procedure in withdrawing the pig iron from the storage yard is as follows: The warrant is presented at the New York office of the American Pig Iron Storage Warrant Company, by whom the signatures of the president and secretary are canceled by punch marks, as indicated in Fig. 4, after the storage has been paid.

The yardmaster's certificate must therefore bear the indorsement of the registrar of the trust company and of the president and the secretary of the storage company before the yardmaster will deliver the iron, this document having become the delivery order which is given to the last holder of the warrant. The storage company also indorses the yardmaster's certificate for storage, as shown in Fig. 3. The holder of the warrant must remove his iron before the first day of the ensuing month, at which time storage charges would otherwise be resumed.

The yardmaster's certificate now bears the following indorsements:

NEW YORK.....19..

Warrant No..... has been issued by the American Pig Iron Storage Warrant Company, and registered by this company. While said warrant, or any reissue of same, is outstanding, this

yardmaster's receipt will be held by this company, and will not be surrendered by it until said warrant is canceled by said warrant company, and its registration canceled by this company.

CENTRAL TRUST COMPANY,
By Ass't Secretary.
NEW YORK,19..

The above named warrant having been canceled as above provided, this yardmaster's receipt is hereby released.

CENTRAL TRUST COMPANY,
By Ass't Secretary.
NEW YORK,19..

The above named warrant issued for the iron described on the reverse hereof having been canceled, the said iron is released for delivery to the holder hereof on presentation and surrender

pany has established its desire to be accurate. The iron is of course weighed again when going out, and it is also subject to inspection as to grade.

Warrants are issued for iron either by analysis or fracture grading. When the analysis basis is selected it is done according to the rules established by the American Society for Testing Materials, which rules have been adopted by the American Foundrymen's Association.

The warrant system as above described has been in operation in this country since 1889. Its aim is to encourage the accumulation of a reserve stock of pig iron. In 1898 it had accumulated 283,000 tons, which was about

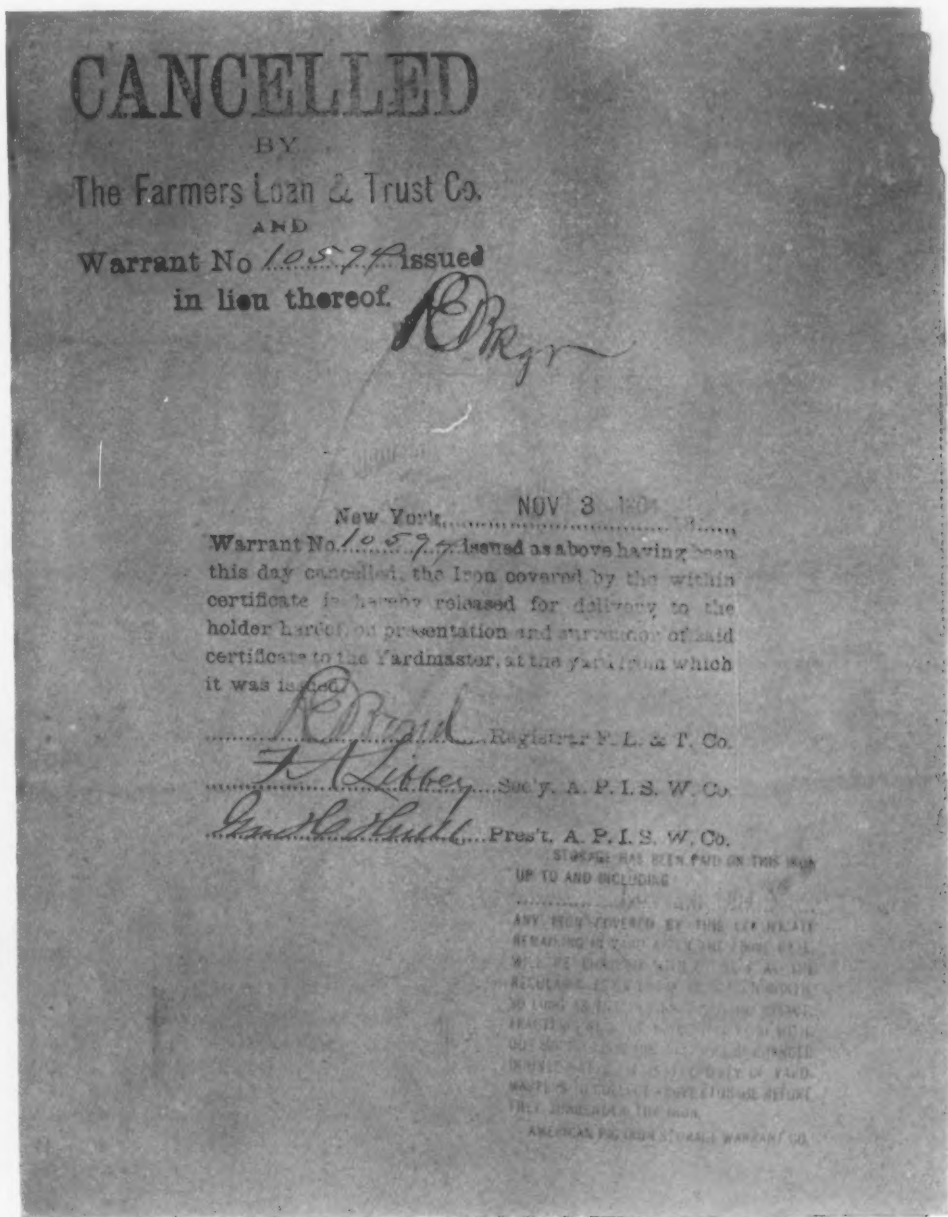


Fig. 3.—Back of Blank A.—Yardmaster's Certificate with Cancellations.

hereof at the yard named. The American Pig Iron Storage Warrant Company, having possession of said iron, recognizes the title thereof in the holder hereof, and will deliver the same to him as above provided.

AMERICAN PIG IRON STORAGE WARRANT COMPANY,
Entered by By

The final step in completing the transaction is the cancellation by the yardmaster of his signature on the certificate and his returning it to the New York office of the American Pig Iron Storage Warrant Company.

Such is in detail the system as it has been developed by the company. During the first ten years there were some complaints of short weights and of inaccuracy in grading. But it was soon found that the double weighing of the iron and the careful grading insured safety. The careful investigation of claims, even trifling, on the part of the American Pig Iron Storage Warrant Com-

pany, having possession of said iron, recognizes the title thereof in the holder hereof, and will deliver the same to him as above provided.

The Pig Iron Certificate.

The pig iron certificate system was inaugurated by the New York Produce Exchange. It is entirely separate and distinct from the warrant system, except that the warrant of the American Pig Iron Storage Warrant Company is the only document which can be converted into a certificate, deliverable in fulfillment of sales made on the exchange. It does not change the warrant system, but simply adds something to it. The form of the certificate is reproduced in Fig. 6.

On some of the other exchanges where commodities are dealt in, such as grain, cotton and coffee, the seller is allowed the option of delivering other grades and sometimes at other locations than the basis, by making

certain specific additions or reductions in the contract price, while the buyer is compelled to take whatever the seller chooses to deliver. The pig iron certificate, however, was created solely to make it possible to give the

duced of continuing to the seller the option as to what he would deliver and giving to the buyer the heretofore unattained option of what he would receive.

The detail necessary to accomplish this is very sim-



Fig. 4.—Fac-simile of Pig Iron Warrant.

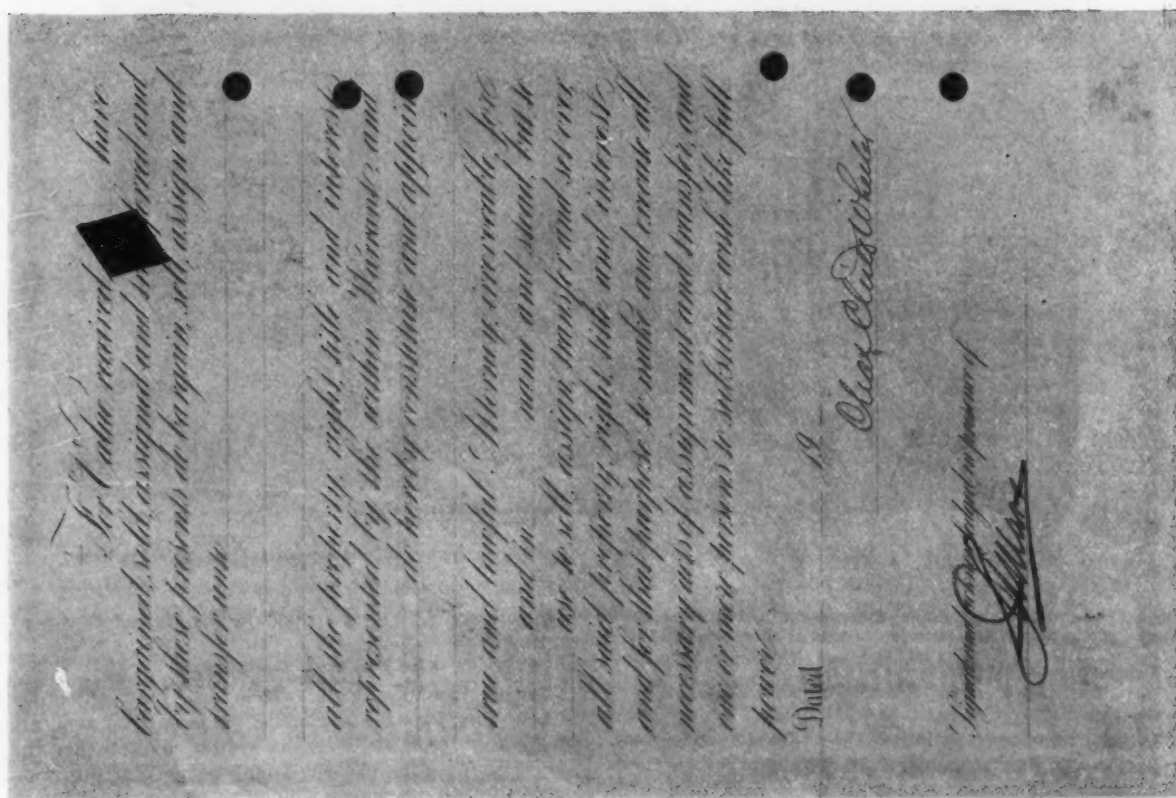


Fig. 5.—Fac-simile of Indorsement of Pig Iron Warrant.

buyer an option as to what he would receive. As long as the warrant was the only document in existence representing the iron this double option was not possible; but by creating the certificate the novel feature was intro-

duced, and in effect it is to make the Farmers' Loan & Trust Company a "clearing house" for warrants. This is accomplished by requiring enough money deposited with the trust company with each warrant to make the war-

rant equal in value with a certain standard. By this means they become interchangeable.

Under this system a pig iron producer may make a contract for a pig iron certificate deliverable at a future date. When the time for delivery arrives he deposits with the trust company a warrant for 100 tons of iron of whatever brand, grade and storage location he elects, with the amount of money required by the exchange rules to make it equal in value to the standard. For this he obtains a certificate, which certificate he delivers to the buyer in fulfillment of his contract.

The buyer, on the other hand, can at any time he chooses surrender this certificate to the Farmers' Loan & Trust Company and demand, in exchange for it, any warrant held by the trust company in that particular group, together with the amount of money originally deposited with said warrant. Thus the seller has the option of delivering on his sale any iron stored at any point which the Produce Exchange has previously approved and listed. The buyer, on the other hand, can

Mechanical Engineers, 2780; American Institute of Electrical Engineers, 3334. The membership of well-known foreign societies was given as follows: Institute of Civil Engineers (January 1, 1905), 6597; Institution of Mechanical Engineers (March 1, 1905), 3977; Iron and Steel Institute (January 1, 1905), 1909; Institution of Electrical Engineers (August 31, 1904), 4303; Verein Deutscher Ingenieure (April 24, 1903), 17,549; Société des Ingenieurs Civil de France (1901), 3691.

President Lieb in the succeeding portion of his address presented the conditions of membership as taken from the constitutions of the four leading American societies, following with a comparison of the receipts and disbursements of the different societies and the expense of membership. Referring to one problem which the American Institute of Electrical Engineers had handled President Lieb said that for the benefit of members who were at such a distance from the headquarters of the society that they could not attend monthly meetings local clubs had been organized, which had done much to



Fig. 3.—Facsimile of Pig Iron Warrant Certificate.

withdraw from the trust company a warrant for any iron which is on deposit with the trust company, together with the amount of money deposited with it.

The Leading Engineering Societies.

In his presidential address before the twenty-second annual convention of the American Institute of Electrical Engineers at Asheville, N. C., June 19, John W. Lieb, Jr., discussed the organization and administration of national engineering societies. He referred at the outset to the formation of engineering societies in Great Britain—the Institution of Mechanical Engineers in 1847, the Iron and Steel Institute in 1869 and the Society of Telegraph Engineers and Electricians in 1871, which became in 1889 the Institution of Electrical Engineers. In our own country the American Society of Civil Engineers was organized in 1852, the American Institute of Mining Engineers in 1871, the American Society of Mechanical Engineers in 1880 and the American Institute of Electrical Engineers in 1884. The membership of these various societies on January 1, 1905, was as follows: American Society of Civil Engineers, 3203; American Institute of Mining Engineers, 3680; American Society of

keep up the interest at distant points. He recognized the tendency of such clubs to secede from the parent society, or at least lose interest in it, but believed on the other hand they had induced accessions to the membership of the national organization and had been an important stimulant of professional activity. Other societies had been watching the result of this undertaking with great interest. The speaker regarded it as no longer an experiment, but added that it had developed new problems and required the constant care and supervision of the central administration.

Travelers between New York and Boston on the New Haven Railroad will have their attention attracted as they pass through Bridgeport by the large signs of the Eaton, Cole & Burnham Company on its two new plants in that city. On one plant the company has just completed an immense sign over 1100 feet long, and at the other plant, on the water front, the company's name has been placed on a 100,000-gallon water tank 130 feet in the air, which can be seen for miles. The Board of Trade of Bridgeport, Conn., has just issued an interesting souvenir book describing the city's various enterprises.

Large German Gas Engines.—II.

Two Cycle Engines. (Continued.)

The double acting pistons are in one sense ideal, as they carry out the rule that all forces should be taken up by the shortest road possible instead of by circuitous routes through passive parts, such as engine bed, foundations, &c. Advantage has not been taken of this fact

has replaced the throttle valve by a valve underneath the cylinder, operated from the governor, by which the excess of air is released (Fig. 7). The ports are covered by a slide operated by hand, thus enabling the size of the inlet opening to be changed (Figs. 8 and 9). This slide must also be counted among the necessary working parts, but as it is situated outside the combustion chamber it is not subject to any great heat.

When the load on the engine is decreased the amount

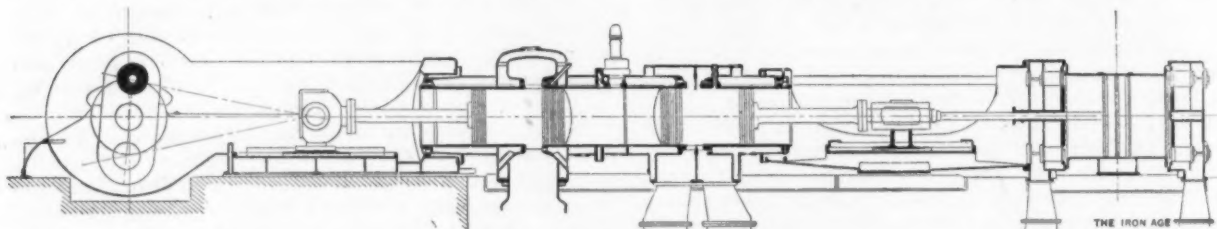


Fig. 6.—Oechelhaeuser Gas Engine (Borsig).—Longitudinal Section.

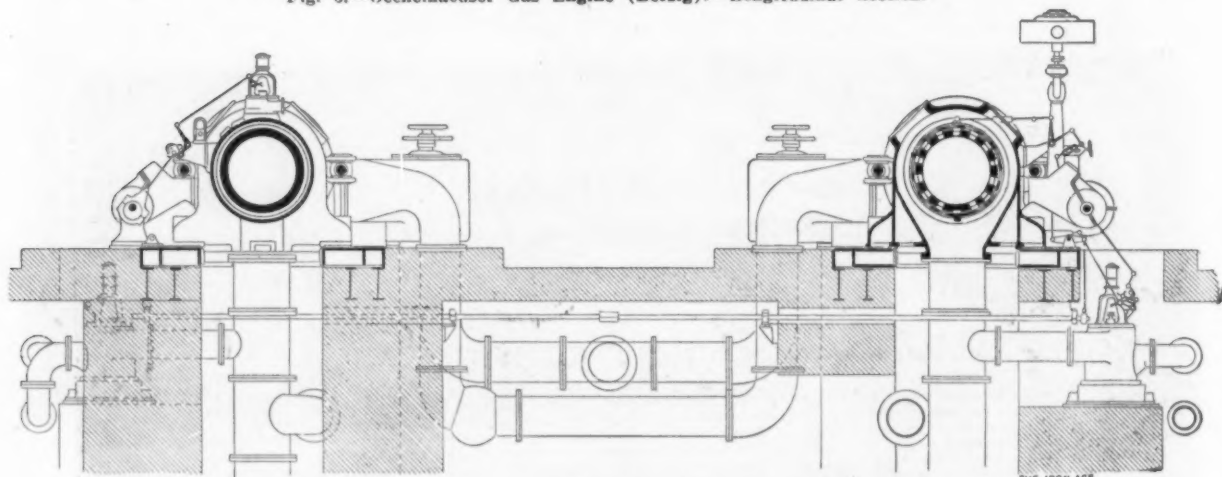


Fig. 7.—Inlet Governing of the Oechelhaeuser Gas Engine (Borsig).

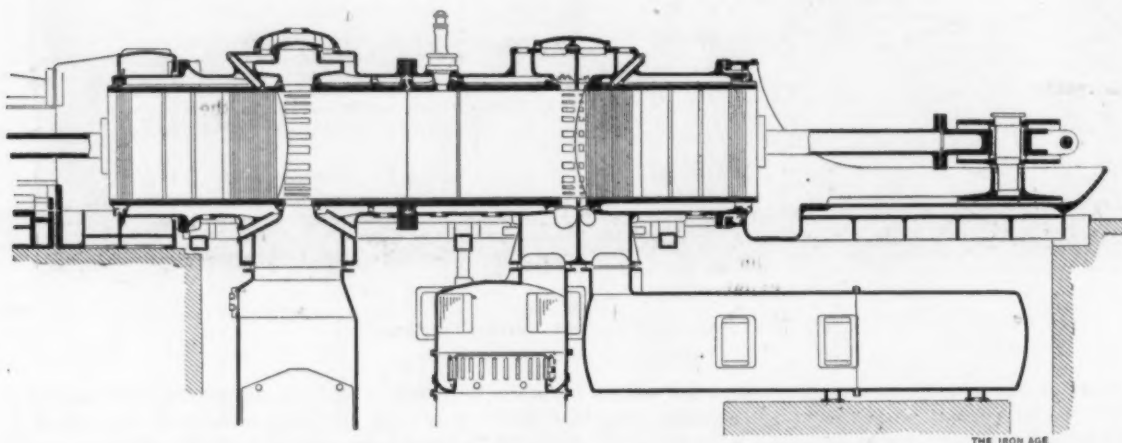


Fig. 8.—Oechelhaeuser Gas Engine (Borsig).—Longitudinal Section through Working Cylinder.

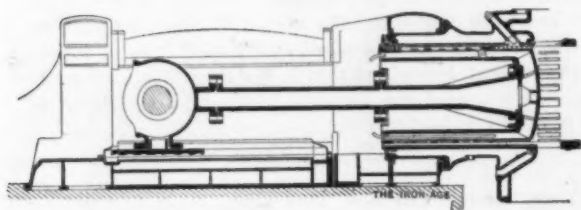


Fig. 9.—Oechelhaeuser Gas Engine.—Forward Working Piston.

as much as it might have been for the cylinder and crank shaft, in spite of the self contained balancing of forces and of mass, have been mounted on heavy engine beds. Only in quite recent times have such engines been built by Borsig, of Berlin, with central mounting of the cylinder, following the pattern of modern steam engines (Fig 6). These engines were originally governed by means of throttling the explosive mixture, but Borsig

of gas will become so small that if it was introduced all around the ports it would not form an explosive mixture. To avoid this evil the above mentioned slide is so operated that the slots opposite the igniting mechanism are gradually closed so that there is always an explosive mixture at the igniter. Figs. 6 to 9 show the construction of the Oechelhaeuser engine as built by Borsig. By reason of the double pistons and the complicated driving mechanism which they entail, such engines as have hitherto been built take up more space than double acting tandem four-cycle engines with their two separate cylinders. Not only is the width greater, but also the length, and a saving can only be made in the latter at the cost of accessibility, as, for instance, by arranging the pumps below ground. The tandem four-cycle engine which is used for comparison is in regard to length the least favorable construction of that type.

Another type of two-cycle engine is that of Koerting, shown in Fig. 10. The basic idea is again of a purely

mechanical nature—i. e., to build a double acting engine while recognizing the necessity of using ring ports instead of valves for operating the exhaust. The result is a long cylinder with the exhaust openings in the center, opened and closed by means of the piston, as it is impracticable to construct a double acting cylinder with annular exhaust ports by any other means.

The principal characteristics and disadvantages of

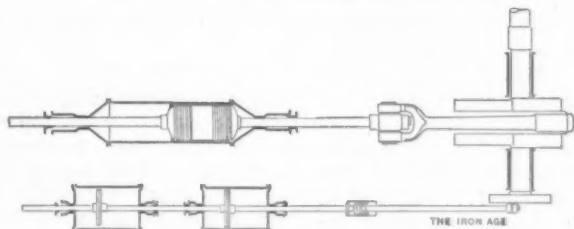


Fig. 10.—Double Acting Two-Cylinder Engine.

this engine are the long piston and cylinder and the necessity of operating the inlet by a valve. The latter is inevitable, because if the working cylinder operates the outlet valves on both ends a similar mechanism for the inlet worked by the same piston is impossible and valves must be used (Fig. 11).

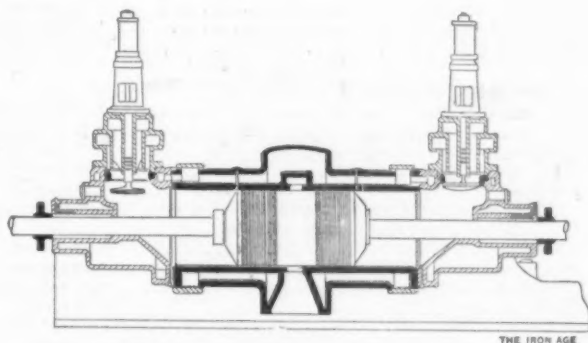


Fig. 11.—Inlet Mechanism for the Double Acting Two-Cycle Cylinder.

As mentioned before, the time available for clearing and charging two-cycle engines is very short, not so short as for the exhaust, but sufficiently so to make the correct construction of the inlet mechanism very difficult. The valves must have a very large area in comparison to those in four-cycle engines, and also a long stroke. The mechanism must raise and lower the valve in a very short space, otherwise clearing and charging would be practically impossible in the time available. Diminishing the valve area causes great resistance and loss.

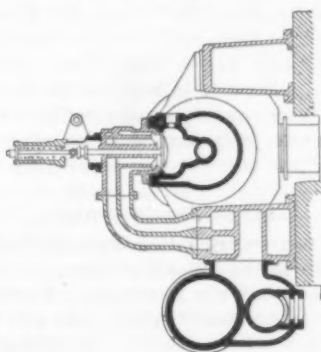


Fig. 13.—Connection of Air and Gas Pumps with Working Cylinder (Koerting).

Another disadvantage is that the side shaft must be run at the same speed as crank shaft, and, therefore, all working parts move at double the speed of those in four-cycle engines. A further inevitable result of the base idea of this type is that the inlet valve cannot be arranged concentrically to the cylinder, but must be to one side of the same. This adds to the difficulty of keeping separate the clearing air and the explosive mixture.

The pistons are built of a length which is almost equal to the stroke; in large gas engines, up to 5 feet; their weight is also increased by the cooling water in their interior. To overcome the momentum of such a great mass with each change of direction is impossible, but to support so great a weight by means of the piston rod is not. In consequence, the working surface of the cylinder suffers from the weight of the piston as well as the pressure of the piston rings. The construction of a double acting gas engine by the means indicated offers advantages which are only apparent. The idea of a long piston, which opens and closes slots in the middle of the cylinder, is extremely simple and an apparent step forward, but it gives rise to practical difficulties which result in this method of construction being indeed a simplification but not an improvement.

Fig. 12 is a diagram of the clearing, charging and governing arrangement of these engines. The pistons of the gas and air pumps are on one rod and are driven by a crank, which arrangement diminishes the length of the engine.

The pumps and also the connection of the air and gas ports with the inlet valve are shown in Fig. 13. This

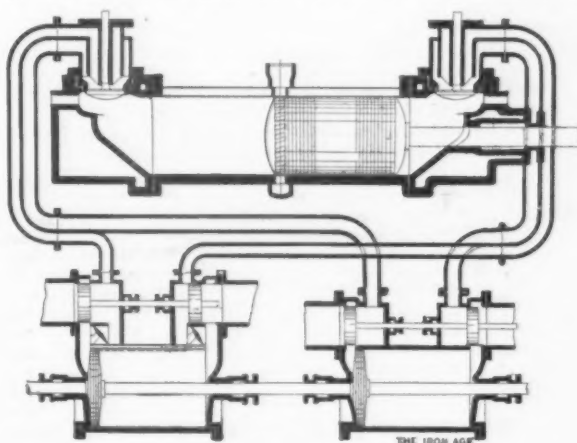
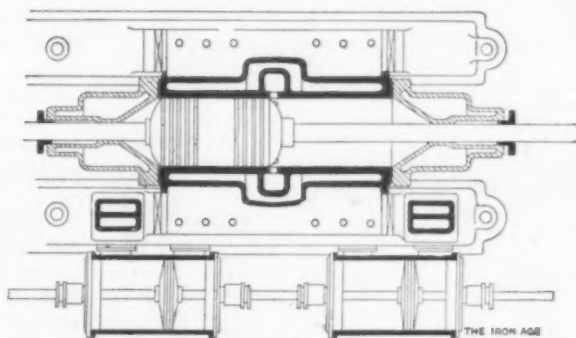


Fig. 12.—Diagram of Charging, Cleaning and Governing Arrangement.

arrangement is clearly more expensive and less economical than driving direct from the piston rod, which, however, necessitates a greater total length. The pumps are operated by means of piston valves, a simple method, which is, however, likely to cause leakage. Since the gas pump has to compress varying amounts of gas to the same pressure as the air from the air pump it cannot be operated by means of simple piston valves, but must be fitted with a special automatic governor. As against these disadvantages, the Koerting engines possess several



advantages—viz., simple general construction, compactness, simplicity of moving parts, &c. A material benefit is due to the fact that the pumps serve to measure accurately the air for clearing and charging, which result is only obtained with other pumps by means of a special arrangement. The engines above described, those of Koerting and Oechelhaeuser, are the only two-cycle engines which have been built for large powers.

(To be continued.)

Effect of Manganese in Low Silicon Cast Iron.*

BY H. C. LOUDENBECK, WILMERDING, PA.

The following tests were made to show the effect of manganese on the chill and fracture of cast iron having a low percentage of silicon.

The mixture was melted in a small test cupola having a diameter of 16 inches inside the lining. Blast pressure, 6 ounces. Size of chilled test pieces, 3 x 4 x 10 inches. These were chilled on the edge, or the 3 x 10 inch face. Test pieces were also cast in the sand to determine fracture and also to obtain drillings for test. These were the same size as the chilled test pieces.

Test No. 1.

	Pounds.	
	Estimated analysis.	Actual analysis.
Mixture....		
{ No. 1 charcoal pig iron.....	40	
{ No. 6 charcoal pig iron.....	60	
{ 80 per cent. ferromanganese.....	2	
	Per cent.	Per cent.
Silicon	0.63	0.55
Manganese	2.01	1.38
Total carbon.....	3.77	3.67
Combined carbon.....		0.62
Phosphorus	0.24	0.22
Sulphur	0.02	0.048

Depth of chill, 2 inches; grain of chill, coarse and fibrous; fracture of sand piece, open, graphitic and very black.

One-inch test bar broke at 2600 pounds per square inch, 12 inches between supports.

Test No. 2.

	Pounds.	
	Estimated analysis.	Actual analysis.
Mixture....		
{ No. 1 charcoal pig iron.....	40	
{ No. 6 charcoal pig iron.....	60	
{ 80 per cent. ferromanganese.....	3	
	Per cent.	Per cent.
Silicon	0.63	0.49
Manganese	2.81	2.00
Total carbon.....	3.77	3.72
Combined carbon.....		0.74
Phosphorus	0.24	0.25
Sulphur	0.02	0.03

Depth of chill, 2 1/4 inches; grain of chill, very coarse and fibrous.

Fracture of sand test piece, mottled on the outside, black in the center.

One-inch test bar broke at 2600 pounds per square inch, 12 inches between supports.

Test No. 3.

	Pounds.	
	Estimated analysis.	Actual analysis.
Mixture....		
{ No. 1 charcoal pig iron.....	40	
{ No. 6 charcoal pig iron.....	60	
{ 80 per cent. ferromanganese.....	3 1/2	
	Per cent.	Per cent.
Silicon	0.63	0.49
Manganese	3.63	2.25
Total carbon.....	3.81	3.70
Combined carbon.....		1.03
Phosphorus	0.26	0.24
Sulphur	0.02	0.025

Depth of chill, 2.30 inches; grain of chill, very coarse; back of chill mottled.

Fracture of sand test piece, chilled on corners and sides, but gray in center.

One-inch test bar broke at 1755 pounds per square inch, 12 inches between supports.

Test No. 4.

	Pounds.	
	Estimated analysis.	Actual analysis.
Mixture....		
{ No. 1 charcoal pig iron.....	40	
{ No. 6 charcoal pig iron.....	60	
{ 80 per cent. ferromanganese.....	5 1/4	
	Per cent.	Per cent.
Silicon	0.60	0.74
Manganese	4.51	3.80
Total carbon.....	3.87	...
Combined carbon.....	1.00	2.52
Phosphorus	0.27	0.27
Sulphur	0.02	0.02

Chilled test piece, white throughout.

Fracture of sand test piece, white, with a few graphitic spots in center.

One-inch test bar broke at 1465 pounds per square inch, 12 inches between supports.

Deductions from the Tests.

The above tests indicate:

1. In cast iron having from 0.50 to 0.70 per cent. silicon the addition of manganese above 1.38 per cent.

gradually hardens the metal, the combined carbon and the chill increasing with the addition of manganese. This statement should be modified to this extent: When smaller or larger castings are made the size of the casting has a marked effect on the cooling of the metal and in that way affects the carbon.

2. When the manganese is high and the casting large enough to be gray, the fracture is open and coarse and the graphite scales very large and crystalline.

3. High manganese to a certain extent prevents absorption of sulphur from coke.

When the manganese is below 1.38 per cent. (this percentage is only approximate and depends largely upon the percentage of silicon present; the lower the silicon the sooner the manganese will commence hardening iron), its action is different; it softens iron, lowers the combined carbon and decreases the chill. This effect is more marked where the sulphur is high, which the following examples will illustrate:

Test No. 5.

Analysis of metal direct from cupola:

Sulphur	0.12 per cent.
Silicon	0.71 per cent.
Manganese	0.27 per cent.
Combined carbon.....	1.60 per cent.
Depth of chill.....	1.75 inches.

Analysis after adding 1/2 pound of 80 per cent. ferromanganese to about 200 pounds of metal:

Silicon	0.71 per cent.
Manganese	0.34 per cent.
Combined carbon.....	1.35 per cent.
Depth of chill.....	1.50 inches.

Test No. 6.

Analysis of metal direct from cupola:

Sulphur	1.25 per cent.
Silicon	0.87 per cent.
Manganese	0.27 per cent.
Combined carbon.....	1.35 per cent.
Depth of chill.....	0.70 inch.

Analysis after adding 1 pound of 80 per cent. ferromanganese to a ladle of about 200 pounds of metal:

Silicon	0.83 per cent.
Manganese	0.63 per cent.
Combined carbon.....	0.50 per cent.
Depth of chill.....	0.30 inch.

Test No. 7.

Analysis of metal direct from cupola:

Silicon	0.57 per cent.
Manganese	0.35 per cent.
Sulphur	0.123 per cent.
Phosphorus	0.39 per cent.
Combined carbon.....	1.20 per cent.
Depth of chill.....	1.40 inches.

Analysis of the metal after adding 3 1/4 pounds of 80 per cent. ferromanganese to about 200 pounds of iron:

Silicon	0.59 per cent.
Manganese	1.70 per cent.
Sulphur	0.023 per cent.
Phosphorus	0.39 per cent.
Depth of chill.....	2 1/2 inches.

Combined carbon, very high.

From the above it may be seen that manganese can be used for not only decreasing but increasing the chill, depending upon the amount of manganese used and the nature of the mixture. There will also be noticed the marked decrease in sulphur where considerable manganese is added. Such a difference is not always attainable, but the conditions in the case were favorable for such a reduction. The metal was very hot, and after adding the ferromanganese the mixture was thoroughly stirred and skimmed.

General Conclusions.

Manganese can be used to advantage in low silicon and chilling iron in the following cases:

In mixtures where the percentage of scrap is large and the sulphur necessarily high (this will occur in a car wheel mixture where usually a large portion of old metal is used) the result of this increase in manganese would be lower sulphur, lower combined carbon, less chill and greater strength.

Very often chilled plates are required having hard chilled faces and soft backs suitable for planing. Manganese added in the right proportion will reduce the tendency to mottle and make a comparatively soft graphitic back.

In all cases where chilling irons are melted in a cupola and the sulphur is over 0.7 per cent. the iron can be strengthened by the use of ferromanganese or pig iron having a high percentage of manganese.

* Paper read before the American Foundrymen's Association, New York, June, 1905.

There are some cases where the manganese should be kept low. In the manufacture of large hydraulic cylinders it is necessary to have a close mottled iron to withstand the pressure and prevent leakage. If the manganese is too high this mottled structure is replaced by a coarse graphitic structure, which is not satisfactory for this class of work. This is illustrated by the two following examples:

Analysis of Hydraulic Cylinder Having 6-Inch Wall, Fracture Having a Close Mottled Structure; Cylinder Very Satisfactory:

	Per cent.
Silicon	0.90
Manganese	0.25
Total carbon	3.34
Combined carbon	1.44
Sulphur	0.136
Phosphorus	0.39

Analysis of a Hydraulic Cylinder Having 6-Inch Wall, Fracture Open and Not Mottled; Cylinder Not Satisfactory:

	Per cent.
Silicon	0.71
Manganese	0.49
Total carbon	2.98
Combined carbon	0.65
Sulphur	0.12
Phosphorus	0.31

A study of the above analysis will bring out the following facts: Manganese was too high in the defective cylinder, which accounts for the low combined carbon and soft character of the mixture. Without doubt this cylinder would have been satisfactory if the manganese had been lower. This was true of subsequent tests. Twenty cylinders were afterward cast which were satisfactory, having low manganese, high combined carbon and a fracture having a mottled structure.

The Dutiable Classification of Steel Wool.

WASHINGTON, D. C., June 27, 1905.—The Treasury Department has decided to acquiesce in a decision of the United States Circuit Court handed down a few days ago with regard to the proper dutiable classification of so-called steel wool. The decision, which is adverse to the Government, determines a number of interesting questions with regard to the customs treatment of manufactures of wire and the Department has been reluctant to accept it as final; but in view of the recommendations of the United States District Attorney and the Attorney-General and the finding of the courts in at least one similar case has decided not to contest the matter further.

The merchandise in the suit consisted of steel wool, which was assessed for duty under paragraph 193 of the Tariff act as a "nonenumerated article manufactured of steel." The Board of General Appraisers reversed the classification of the collector and assessed duty under paragraph 135, providing for "steel in all forms and shapes not especially provided for." The importers, however, claimed that it should have been assessed under paragraph 137 as an article "manufactured from round steel wire not especially provided for."

The Process of Manufacture.

It was as to the last mentioned contention that the chief controversy arose in this case. The Government claimed that while the article in question was made from steel wire, it might be, and frequently is, made from sheets, bands and other forms of steel. It appeared that the process employed in this case is substantially as follows: A machine first shaves off a strip or segment from one side of the wire along the entire length of the coil to produce a flat surface for the tool to work upon. The strip so removed goes to the scrap pile. The remaining portion of the wire then passes under toothed knives, which take off a number of very fine shavings having as nearly as may be triangular cross sections. These constitute the merchandise in question. When the end of the reel of wire is reached the machine is reversed and the process is repeated until the remaining portion of the wire is too thin to stand the strain of the machinery without breaking, when the remnant is removed and also goes in the scrap.

While the Government admitted that the importation was made from steel wire it denied that the terms of

paragraph 137, covering manufactures of wire, applied in this case. The paragraph referred to provides a duty additional to that imposed upon the wire of which the goods are made. The wires that may be used are subject to various rates of duty under the law, but it would be impossible to administer the law if steel wool were to be classified under paragraph 137, because the customs officers could not judge the size, shape, quality or value of the wire, which is not present for examination, but a portion of which has disappeared and the remainder has been shaved up into fine hairlike filaments. The Government furthermore contended that inasmuch as steel wool may be made from bands, strips or sheets of steel as well as from wire, and as an inspection of the article would not disclose which material was used, a construction should not be adopted that would make the same article pay two or more different rates of duty according to the material of which it was produced. Such a ruling might result in one importer paying a higher duty than another, whereas it is to meet such cases that the courts have laid down the rule that duties must be assessed upon the article "in the condition in which it is imported."

Not a Manufacture of Wire.

In discussing this appeal the United States Circuit Court disposed of the contention that the merchandise should pay the rate provided by paragraph 137 as a manufacture of wire as follows:

Paragraph 137 fixes various rates of duty for round iron and steel wire of various sizes, respectively, "provided that articles manufactured from . . . steel wire shall pay the rate of duty imposed upon the wire used in the manufacture of such articles" and certain additional duties. This article is not round steel wire. It is only manufactured from steel wire in the sense that wires are cut up in order to make this product, such cutting process resulting in the destruction of the wire. It would be impracticable for the customs authorities to determine by inspection or analysis the gauge of the wire from which the steel wool was manufactured. It would seem that said proviso was not intended to apply to articles of this character, and the protest of the importers is, therefore, overruled.

The court then took up the claim of the Government that the goods should pay duty at 45 per cent. ad valorem as a "nonenumerated article manufactured of steel," which was rejected by the Board of General Appraisers in favor of a lower specific rate of duty provided by paragraph 135 for "steel in all forms and shapes not especially provided for." After examining several previous decisions with regard to the scope of the so-called "basket clause" of the metal schedule the court decided that paragraph 135, which levies the lower rate of duty, is more specific in its terms than the basket clause and therefore affirmed the decision of the board adverse to the Government. In view of the facts in the case and other decisions referred to the Government has acquiesced in the opinion of the Circuit Court. W. L. C.

The Merchant Marine.—Harvey D. Goulder of Cleveland, president of the Merchant Marine League of the United States, and Senator J. H. Gallinger of New Hampshire, chairman of the Merchant Marine Commission, addressed a meeting of shipowners, merchants and manufacturers at the Boston Chamber of Commerce June 23 on the need of a greater American merchant marine. Senator Gallinger said: "We have suggested as the result of our hearings that which we believe will be the means of rehabilitating the American merchant marine. I don't want to be too optimistic, but I am going to prophesy that before the next Congress ends that bill or some similar measure will be enacted into law. Unless we do something to rehabilitate the American merchant marine the American flag will rarely be seen on a ship passing through the Panama waterway."

Quebec Requires Licenses for Traveling Salesmen.—Through the courtesy of B. & S. H. Thompson & Co., Limited, Montreal, Canada, we learn that an act was recently passed by the Quebec Government which compels all travelers soliciting orders in the Province of Quebec, and who represent firms not having a place of business in Canada, to pay a license of \$300 a year, in default of which they are liable to a penalty of \$500 fine.

A Pacific Coast Furnace Project.

A project for a large blast furnace at Tacoma or some adjacent point on the north Pacific Coast is drawing toward completion. This project rests upon the iron ore mountain found some time ago in southeastern California, near the Nevada line and not far from the new Salt Lake, Los Angeles & San Pedro Railroad. This mountain of ore is an isolated peak, and consists of hematite covered by a very slight surface. It can be easily mined by steam shovel, being a soft ore, and its grade is excellent, averaging, so far as explorations have shown, about 58 to 60 per cent. iron and running partly below and partly above the Bessemer limit in phosphorus.

The cost of and increasing demand for pig iron on the Western coast has been the determining factor in this proposed development. The projectors of the scheme

A New Ridgway Eight-Foot Radial Drill.

The principal consideration in the design of most machine tools which have been brought out of late has been to make them capable of using high speed steel tools. This factor has been the important one in view in the production of the new plain radial drill manufactured by the Ridgway Machine Tool Company, Ridgway, Pa. This concern, though a comparatively young one, has already introduced a number of tools notable for their size and power. One such was described in *The Iron Age* March 30, this being a boring and turning mill, and in the same issue was given a description of the company's plant.

The radial drill shown in Fig. 1 is one embodying great strength and rigidity to allow the use of heavy high speed drills and contains many new and interesting

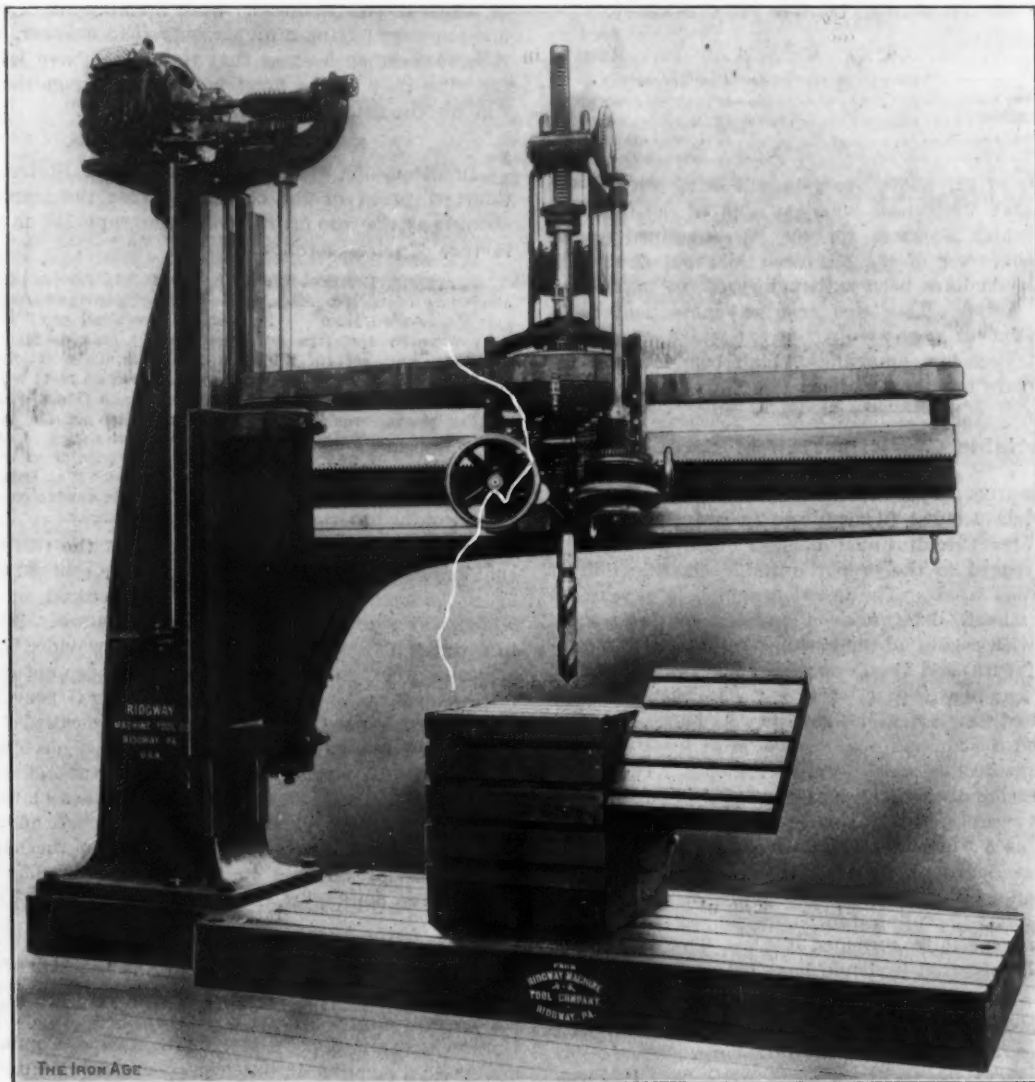


Fig. 1.—New 8-Foot Radial Drill, Built by the Ridgway Machine Tool Company, Ridgway, Pa.

have secured rail rates to San Pedro Harbor of \$3.25 a ton and an ocean rate to Tacoma of 75 cents. To be added to this is a 50-cent dock charge, making the cost of transportation of ore from the mine to Tacoma \$3.50 a ton. It is proposed to utilize coast coal for coke and to erect a furnace of about 350 tons capacity. Alfred Merritt, the owner of the ore property, is associated with some Tacoma men in this enterprise. Mr. Merritt is now at Pasadena, Cal., but spends much of his time in Duluth, Minn., where he has large interests.

This development is in line with that proposed for the southwestern Utah iron, which is similar in character and probably of the same formation as that owned by Mr. Merritt. Owners of all this ore expect that the changes and growth to come in the Orient after the close of the present war will bring their properties into active operation.

features. Only second in importance has been the consideration of adequate means of oiling running parts and the provision of bushings in all bearings where their use may improve the efficiency.

The machine is built in four sizes of from 5 to 8 feet inclusive, the latter size being the one shown in Fig. 1. The base is deep and of almost complete box section, affording exceptional stiffness, upon which the accuracy of a drill so largely depends. The column is of large box section and is securely bolted to the base. On the front face of the column are guides on which a long shoe slides vertically, this carrying the swinging arm, upon which the drill spindle head travels horizontally. The swinging arm is also of complete box section to give the stiffest possible construction.

The head is compactly designed and very convenient in its arrangement. The drill spindle is of high carbon

steel accurately ground to size. The spindle itself does not run in bearings, but is carried in a long sleeve running in a lumen bronze lined bearing. The feed is operated by a pull spline and slip gears and a rack above the spindle. The spindle and rack are coupled by an adjustable connection, providing compensating means for wear, by which is avoided the objectionable "biting in" as the drill comes through. The spindle and rack are counterbalanced by a weight suspended at the back of the frame carrying the feed rack.

The head is traversed on the arm by the hand wheel seen at the left of the head, which connects with a pinion engaging the rack on the arm, also to be seen in the engraving. A handle is provided in a convenient location by which the head may be instantly clamped to the arm without requiring the use of a wrench.

Perhaps the most striking feature of the machine in its motor driven form is the drive. The motor has a speed range of 6 to 1, controlled by a small controller secured to the back of the arm, where it is always within convenient reach of the operator. Unfortunately at the time the photograph was taken the controller was not in position, which accounts for its omission in the view given. It has been secured to the back of the arm, where only the handle would appear in the front view, it being

which the Clyde Engineering Company, Granville, N. S. W., will submit an offer that the Government can accept.

The Canadian Iron Trade in 1904.

James M. Swank, general manager of the American Iron and Steel Association, gives in the *Bulletin* the statistics of the production of steel ingots and castings and of all finished rolled iron and steel in Canada in 1904, which he has received from the manufacturers.

The total production of steel ingots and castings was 148,784 gross tons, against 181,514 tons in 1903, a decrease of 32,730 tons. Bessemer and open hearth steel ingots and castings were made in each year. Almost all the open hearth steel reported in 1903 and 1904 was made by the basic process. The direct steel castings made in 1904 amounted to 6505 tons. Canada has not made crucible steel prior to the present year.

The following table gives the production of all kinds of steel ingots and castings in Canada from 1894 to 1904:

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1894.....	25,685	1898.....	21,540	1902.....	182,037
1895.....	17,000	1899.....	22,000	1903.....	181,514
1896.....	16,000	1900.....	23,577	1904.....	148,784
1897.....	18,400	1901.....	26,084		

The following table gives the production of all kinds

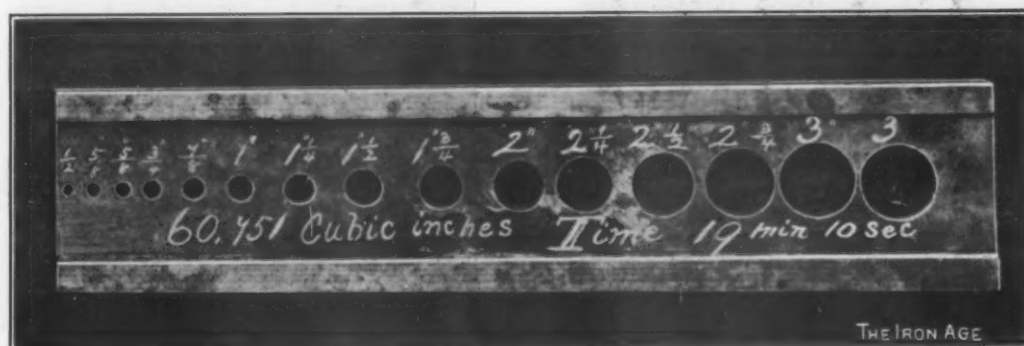


Fig. 2.—A Piece of Test Work, Showing the Rapidity Attainable in Cutting and Changing Drills.

similar to the handle at the extreme end of the frame and about half way between it and the drill. A flange coupling connects the driving spindle to the armature shaft. On this driving spindle is keyed a bronze pinion engaging a large bevel gear keyed to the vertical driving shaft, on which the pulley driving the head slides when the arm is raised or lowered. This arrangement employs the least mechanism possible, which is very desirable when reversing. The reversing for tapping, &c., is obtained directly through the motor by manipulating the speed controller; thus the entire control of the machine as to speed and direction of rotation is obtained from a single handle. For extra heavy drilling and tapping suitable slower speeds are obtained by back gears on the head.

Fig. 2 shows a piece of test work which indicates the facility with which this machine can be handled in spite of its size and also the adaptability for a wide range of sizes of holes. The time marked on the work, 19 minutes 10 seconds, was the total time consumed, including the stopping of the machine and the changing of the drills. In this test the total amount of metal removed was 60.751 cubic inches. This is believed to be a new record for fast drilling. The actual cutting time was 12 minutes 5 seconds, and the time consumed in changing drills 7 minutes 5 seconds.

The Manufacture of Locomotives in Australia.—It now appears that the 60 locomotives required by New South Wales are to be manufactured locally. There have been further interviews between the Premier and those interested, with the result that both workmen and employers engaged in the iron trades are disposed to make such concessions in regard to wages and price as will bring the cost of the locally produced engines within reasonable distance of what they can be supplied for from England or America. No contract has yet been made, but an understanding has been effected under

of iron and steel rolled into finished forms in Canada from 1895 to 1904:

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1895.....	66,402	1899.....	110,642	1902.....	161,485
1896.....	75,043	1900.....	100,690	1903.....	129,516
1897.....	77,021	1901.....	112,007	1904.....	180,038
1898.....	90,303				

The production of Bessemer and open hearth steel rails in 1904 amounted to 36,216 gross tons, against 1243 tons in 1903; structural shapes, 447 tons, against 1983 tons in 1903; cut nails made by rolling mills and steel works having cut nail factories connected with their plants, 99,000 kegs, against 118,686 kegs in 1903; plates and sheets, 3102 tons, against 2450 tons in 1903; all other finished rolled products, excluding muck and scrap bars, blooms, billets, sheet bars and other unfinished forms, 135,243 tons, against 118,541 tons in 1903. Of the 180,038 tons of finished iron and steel reported for 1904 about 126,850 tons were steel and 53,188 tons were iron.

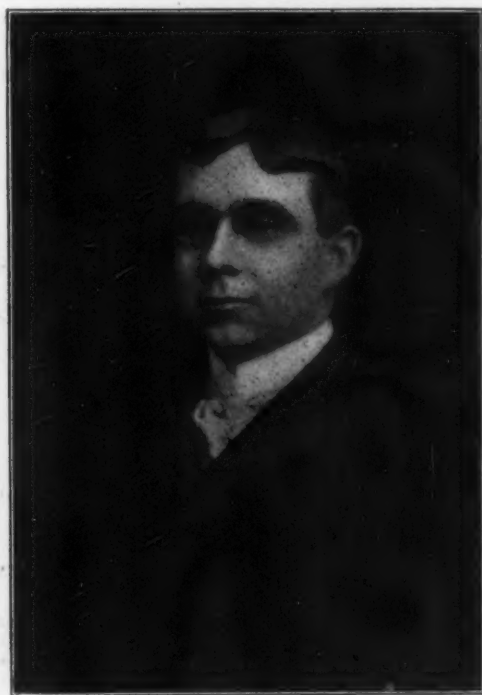
On December 31, 1904, there were 18 completed rolling mills and steel works in Canada. In addition three plants were being built and two plants were projected. Of the completed plants two were equipped for the manufacture of steel castings only, five for the manufacture of Bessemer or open hearth steel ingots and rolled products and eleven for the manufacture of rolled products only. Of the building plants one was being equipped for the manufacture of steel castings by a special process, one for the manufacture of open hearth steel ingots only and one for the manufacture of merchant bar iron, railway spikes, &c. One of the projected plants is to be equipped for the manufacture of wire rods.

Of the 18 completed rolling mills and steel works in Canada on December 31, 1904, three were located in Nova Scotia, five in Quebec, nine in Ontario and one in New Brunswick. The building plants are in Nova Scotia, Ontario and Manitoba, and the projected plants are in Ontario.

Victims of the Lake Shore Railroad Disaster.

Railroad accidents have recently robbed the iron trade of a number of very prominent men. The disaster on the Pennsylvania Railroad at Harrisburg, Pa., on May 11, resulting in the death of several Pittsburgh manufacturers, is still fresh in the memory of our readers, but on June 21 occurred a still worse accident in the wreck of the Twentieth Century Limited on the Lake Shore Railroad at Mentor, Ohio. Numbered among the Mentor dead are Charles H. Wellman and T. R. Morgan of the Wellman-Seaver-Morgan Company, Cleveland, Ohio; A. P. Head, director of the Otis Steel Company, Cleveland, Ohio, and member of the firm of Jeremiah Head & Son, London, England; James H. Gibson, secretary of the American Foundry & Machinery Company, Chicago; H. C. Mechling, New York, Eastern manager of the Wheeling Corrugating Company; H. H. Wright, vice-president and general manager of the Featherstone Foundry & Machine Company, Chicago; A. L. Rogers, New

Thomas R. Morgan was born in 1859 in South Wales and was brought by his parents to this country at the age of six. His father organized the Pittsburgh Steam Hammer Works and later removed to Alliance, Ohio, engaging in the business which later became the Morgan Engineering Company. Mr. Morgan's practical experience began in his father's works in Pittsburgh, and after finishing his studies in Mount Union College he entered the works at Alliance, becoming superintendent of the works at the age of 16, general manager at 21 and at 25 was secretary and general manager of the company. In 1897, on the death of his father, he disposed of his interests in and severed his connection with the company, and later engaged with the Wellman-Seaver Engineering Company. In 1902, in recognition of his services and ability, the name of the company was changed to the Wellman-Seaver-Morgan Engineering Company, of which he was at that time secretary and works manager. On consolidation with the Webster, Camp & Lane Company, Akron, Ohio, the company name was changed to the pres-



CHARLES H. WELLMAN.



THOMAS R. MORGAN.

York, assistant to the president of the Platt Iron Works, Dayton, Ohio. Also numbered among the victims were John R. Bennett, New York, the famous patent lawyer, frequently employed by iron and steel manufacturers, and S. C. Beckwith, New York, one of the best known advertising agents in the country.

Charles H. Wellman and Thomas R. Morgan.

Charles H. Wellman was born June 12, 1865, at Nashua, N. H., his father being superintendent of the Nashua Iron Company. In October, 1881, he secured a position at the works of the Morgan Engineering Company, Alliance, Ohio, where he served his time as machinist and draftsman. In 1885 he became chief draftsman at the Otis Steel Works, Cleveland, Ohio, and soon after was placed in charge of the open hearth department. In 1890 he became superintendent of the Wellman Steel Company at Thurlow, Pa., leaving there in 1895 to become open hearth superintendent of the Illinois Steel Company at South Chicago. In 1896, with S. T. Wellman, who is now president of the Wellman-Seaver-Morgan Company, and with John W. Seaver, now chairman of the same organization, he organized the Wellman-Seaver Engineering Company, becoming engineer and general manager of the company. At the time of his death he was general manager of the Wellman-Seaver-Morgan Company. He is survived by his widow and three children.

ent title, the Wellman-Seaver-Morgan Company, Mr. Morgan being second vice-president and works manager at the time of his death. He also leaves a widow and three children.

Both Mr. Wellman and Mr. Morgan were men of wide acquaintance and of prominence in their chosen fields of work. Their sudden death comes as a shock not only to their extensive circle of friends but with especial force to their business associates and to the employees of the company. The company itself with which they have been so prominently identified will go forward with its work saddened by its great bereavement and deeply feeling the loss of their personality. The organization, however, is so comprehensive and complete and so thoroughly perfected in all its details that its various enterprises will be thoroughly cared for and its work go forward in the accustomed channels and without hindrance or delay.

A. P. Head.

A. P. Head of London, England, was educated at Clifton College and University College, London. In 1890 he became assistant to his father, Jeremiah Head, consulting engineer, and in 1894 became his partner, moving the office from Middlesbrough to London, under the style of Jeremiah Head & Son. Jeremiah Head died in 1899, and in 1904 another son, Benjamin W. Head, was taken into partnership, the style of the firm remaining unchanged. Since 1899 A. P. Head has acted as joint

managing director of the Otis Steel Company, Limited, Cleveland, and crossed the ocean 15 times to visit the plant. He was a brilliant engineer and had read numerous valuable papers before the Institute of Civil Engineers, Iron and Steel Institute, Society of Arts, &c., on engineering and metallurgical subjects.

James H. Gibson.

James H. Gibson, secretary and general manager of the American Foundry & Machinery Company, Monadnock Block, Chicago, was born at Ellsworth, Ill., December 7, 1867, and started with the Walburn-Swenson Mfg. Company, Chicago, as a young man in the capacity of stenographer, rising by force of intelligent service until he became secretary and general manager of the firm which succeeded it. He leaves a widow and two children.

Herman C. Mechling.

Herman C. Mechling had been connected with the Wheeling Corrugating Company since its inception, 15 years ago, and for ten years prior to that with the Whitaker interests. His territory included the Eastern district, in which he had a host of friends among the retail tradesmen, and his loss will be a personal one to them as well as his business associates. He had lived in New York for 20 years, and at the time of his death resided at Ninety-seventh street and Shore road, Brooklyn. He leaves a widow, a son about 24 years old, who is in the New York office of the Wheeling Corrugating Company, and a daughter.

H. H. Wright.

H. H. Wright, vice-president and general manager of the Featherstone Foundry & Machine Company, Chicago, and assistant to the president of the C. M. Hewitt Company of the same city, was born at Garrett, Ind., and was 32 years of age at the time of his death. He entered the employ of Charles M. Hewitt 13 years ago, and his unusual ability and personal qualifications led to his rapid advancement, until he occupied the two positions named above, Mr. Hewitt being president of both companies. He leaves a widow and daughter.

A. L. Rogers.

Abraham Lincoln Rogers was born at Fort Wayne, Ind., 40 years ago, and was graduated from Lehigh University in the class of 1889 as a mechanical engineer. He was a salesman for a time with the Edward P. Allis Company, Milwaukee, Wis., and later became connected with the Stirling Company, Barberton, Ohio, manufacturer of water tube boilers, with which concern he spent nine years of his business life. Last January he connected himself with the Platt Iron Works, and in his position as assistant to the president of the company he occupied an executive office of much responsibility. He was on his way from the company's works to the New York office when the accident occurred, and it is a sad fact that he had arranged to start the day before but was delayed. He is survived by a widow and one son.

The Pickands-Magee Coke Company, Frick Building, Pittsburgh, has purchased the property and ovens of the Riverview Coal & Coke Company, in the Masontown (Pa.) field, and plans will be made at once for extensions and improvements at the plant, that will involve an outlay of about \$1,000,000. A new company has been organized to take over the Riverview interests, to be known as the Southern Connellsville Coke Company. The plant embraces 900 acres of coking coal and 220 ovens. The plant will be extended to contain 500 ovens, a crushing and washing plant will be installed, and a large number of dwelling houses for employees will be erected. W. C. Magee is president of the new company, Harry Whyel, vice-president and general manager, and J. W. Seaman, secretary and treasurer. The directors include these officials and Thomas Morrison, formerly of the Carnegie Steel Company and now a director of the United States Steel Corporation. The Pickands-Magee Coke Company now controls the product of the Southern Connellsville Coke Company, Masontown Coal & Coke Company, Whyel Coke Company, Leckrone Coke Company

and smaller plants, making it one of the largest independent coke operators in the Connellsville region.

An Important Labor Decision in Massachusetts.

The full bench of the Massachusetts Supreme Court has handed down an important decision which makes an officer of a union financially liable for procuring the discharge of a nonunion workman. An award of \$1500 damages in a lower court is sustained. A shoe manufacturing company of Haverhill, Mass., entered into an agreement with the Boot and Shoe Makers' Union that it would employ only union workmen and that it would not retain in its employ any workman after due notice from the union that he was objectionable to the union either on account of being in arrears for dues, disobedience of union rules or from other cause. The plaintiff Berry was discharged from his employment soon after the agreement was signed. The defendant Donovan of the Boot and Shoe Makers' Union maintained that his interference by which he procured Berry's discharge was justifiable and lawful under the contract, because Berry's contract with his employer was not for a definite period, but terminable at the will of his employer. A jury awarded damages, and the Supreme Court holds that the defendant's contention is not a sound one and that interference by labor unions is not justifiable on the ground of competition between union and nonunion employees. The decision, written by Chief Justice Knowlton, states:

The gain which a labor union may expect to derive from inducing others to join it is not an improvement to be obtained directly in the conditions under which the men are working, but only added strength for such contests with employers as may arise in the future.

An object of this kind is too remote to be considered a benefit in business such as would justify the infliction of intentional injury upon a third person for the purpose of obtaining it. If such an object were treated as legitimate and allowed to be pursued to its complete accomplishment every employee would be forced into membership in a union, and the unions, by a combination of those in different trades and occupations, would have complete and absolute control of all the industries of the country.

Employers would be forced to yield to all their demands or give up business. The attainment of such an object in the struggle with employers would not be competition, but monopoly. A monopoly controlling anything which the world must have is fatal to prosperity and progress. In matters of this kind the law does not tolerate monopolies.

The attempt to force all laborers to combine in unions is against the policy of the law, because it aims at monopoly. It therefore does not justify causing the discharge by his employer of an individual laborer working under a contract. It is easy to see that for different reasons an act which can be done in legitimate competition by one or two or three persons, each proceeding independently, might take an entirely different character both in its nature and its purpose if done by hundreds in combination.

We have no desire to put obstacles in the way of employees who are seeking by combination to obtain better conditions for themselves and their families. We have no doubt that laboring men have derived and may hereafter derive advantages from organization. We only say that under correct rules of law and with a proper regard for the rights of individuals labor unions cannot be permitted to drive men out of employment because they choose to work independently.

If disagreements between those who furnish the capital and those who perform the labor employed in industrial enterprises are to be settled only by industrial wars it would give a great advantage to combinations of employees if they could be permitted by force to obtain a monopoly of the labor market. But we are hopeful that this kind of warfare will soon give way to industrial peace and that rational methods of settling such controversies will be adopted universally.

The Shearing Strength of Rivets.

The following report on the shearing strength of rivets was read at the Chicago convention last week by E. S. Fitzsimmons, chairman of the committee appointed at the previous annual convention of the Master Steam Boiler Makers to investigate and report on this subject:

On beginning our tests a number of pieces were prepared according to rules and formulas approved by mechanical engineers and which are in use at the present time by many, if not all, of the prominent builders. While a number of the joints showed an efficiency above that rated for them we found that invariably they showed a weakness at the edges of the plate, tearing out from edge of hole to edge of plate, so that from these pieces it was impossible to determine the actual shearing strength of the rivet. We at first concluded we had made an error in preparing the plates. However, on checking up our work we found conditions as follows:

A standard rule in practice, accepted generally by the builders, is as follows: For distance from center of rivet hole to edge of plate, take $D \times 1.5$, which in our case would be diameter of hole, 13-16 inch $\times 1.5 = 1.21$ inches. This we increased slightly, making the lap $1\frac{1}{4}$ inches, and to further insure the shearing of the rivet we used $\frac{1}{2}$ -inch plate with $\frac{3}{4}$ -inch rivets in 13-16-inch holes, and out of eight pieces tested with the rivets in double shear (four with iron and four with steel rivets) each one of them fractured at the edge of the plate.

We next prepared four pieces with rivets in double shear, two having iron and two steel rivets, one hand and one machine riveted, and instead of using the constant 1.5 we used 2, which would be as follows: $0.8125 \times 2 = 1.625$, or $1\frac{5}{8}$ inches.

On testing the first piece, using iron rivets in double shear, with distance from center of hole to edge of plate as above, the result was as follows: Shearing strength of one rivet 42,240 pounds; shearing strength per square inch, 81,481 pounds; hole elongated and end of plate distorted, 0.16 inch.

The next test resulted as follows: Iron rivet in double shear—shearing strength of one rivet, 40,920 pounds; shearing strength per square inch, 78,934 pounds; hole elongated and end of plate distorted, about the same as first test.

We next tested a piece prepared the same as the two previous tests, except with steel rivets in double shear, which resulted as follows: Shearing strength of one rivet, 46,575 pounds; shearing strength per square inch, 89,843 pounds. In this case the hole was elongated and end of plate distorted 0.34 inch.

The next test with steel rivet in double shear resulted as follows: Shearing strength of one rivet, 43,805 pounds; shearing strength per square inch, 84,500 pounds; hole elongated and end of plate distorted, 0.29 inch.

The rivets in single shear resulted as follows:

1. Test iron rivet—shearing strength of one rivet, 22,190 pounds; shearing strength per square inch, 42,824 pounds.
2. Test iron rivet—shearing strength of one rivet, 20,840 pounds; shearing strength per square inch, 39,409 pounds.
3. Test steel rivet—shearing strength of one rivet, 25,840 pounds; shearing strength per square inch, 49,845 pounds.
4. Test steel rivet—shearing strength of one rivet, 25,840 pounds; shearing strength per square inch, 49,845 pounds.

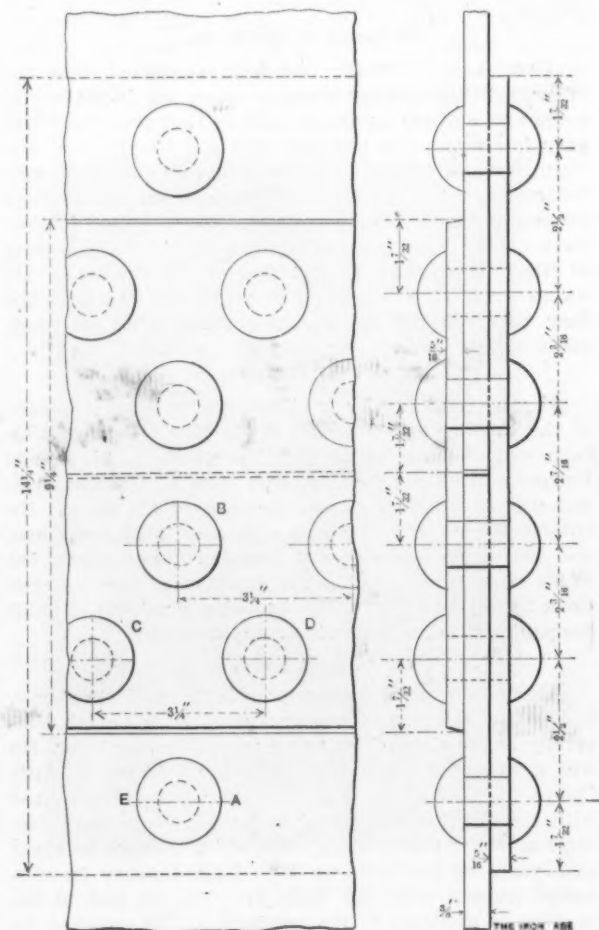
It will be noticed by the above that the steel rivets in single shear showed exactly the same results.

Following is a table showing the kind of rivets, diameter and area of hole, shearing strength of one rivet, shearing strength per square inch and increase in percentage for double over single shear. From this it will be noted that the increase for double over single shear averages considerably higher in iron rivets than it does in steel rivets; also that the increase is greater for machine driven rivets than for hand driven, this being at-

tributed to the frictional resistance of the plates, which is not so effective in the hand work:

No. of test.	Kind.	Shear.	Diameter. Inch.	Area. Inch.	One rivet. Pounds.	Per square inch. Pounds.	Increase double over single. Per cent.	
1	Iron	Single	13-16	0.5184	22,190	42,824	...	Hand
2	Iron	Double	13-16	0.5184	42,240	81,481	90	driven.
3	Iron	Single	13-16	0.5184	20,430	39,409	...	Machine
4	Iron	Double	13-16	0.5184	40,920	78,934	104	driven.
5	Steel	Single	13-16	0.5184	25,840	49,845	...	Machine
6	Steel	Double	13-16	0.5184	46,575	89,843	80	driven.
7	Steel	Single	13-16	0.5184	25,840	49,845	...	Hand
8	Steel	Double	13-16	0.5184	43,805	84,500	69	driven.

We next prepared a triple riveted butt strap joint, using $\frac{3}{8}$ -inch plates with $\frac{3}{4}$ -inch rivets (iron) in 13-16-inch drilled holes, as shown in the illustration herewith. This joint has a rated efficiency of 87.5 per cent. Using



Triple Riveted Butt Strap Joint.

THE SHEARING STRENGTH OF RIVETS.

a section of $6\frac{1}{2}$ -inch wide plate, $\frac{3}{8}$ -inch thick, steel of 58,500 pounds test strength, the strength of the solid plate should be $0.375 \times 6.5 \times 58,500$, which equals 142,593 pounds; 87.5 per cent. of this would be 115,145 pounds. By actual test this joint developed a strength of 115,120 pounds, or only 25 pounds less than the calculated strength.

Now, assuming that each rivet in this joint would sustain as great a load as in test No. 2 in the table, the shearing strength of the rivets in the section tested would be 42,240 pounds $\times 3$ (number of rivets in double shear) plus 22,190 pounds (one rivet in single shear), or 148,910 pounds, or 22 per cent. stronger than the ultimate strength of the section tested.

Next taking the net section at A, on the illustration, we have $6\frac{1}{2}$ inches, or $104 - 16 = 88$, which divided by 104, the original or solid plate, gives 87.5, or the rated efficiency of the joint. However, our tests showed the net section not to be the weakest point, but the fracture occurred first at B, tearing out from the hole to the edge of the plate at the first row, the same as in the first tests, and next shearing off rivets C D and E.

Now, as neither the ultimate strength of the net

section nor the shearing strength of the rivets was actually reached when rupture occurred, it will be evident to all that this joint can be made considerably stronger by adding to the distance from the center of the hole to the edge of the plate, or, in other words, using 2 as a constant instead of 1.5 in calculations for rivets in double shear, as we found necessary to do in our tests previously described to ascertain the shearing strength of the rivets.

The shearing strength of rivets we find to be about as follows:

For riveted plates:	Pounds.
Iron rivets, single shear, average per square inch.....	40,000
Iron rivets, double shear, average per square inch.....	78,000
Steel rivets, single shear, average per square inch.....	49,000
Steel rivets, double shear, average per square inch.....	84,000

In addition we wish to invite your attention to the following points of interest:

1. The noticeably greater increase for iron rivets in double shear over their single shearing strength, as compared to steel rivets in double shear over their single shearing strength.

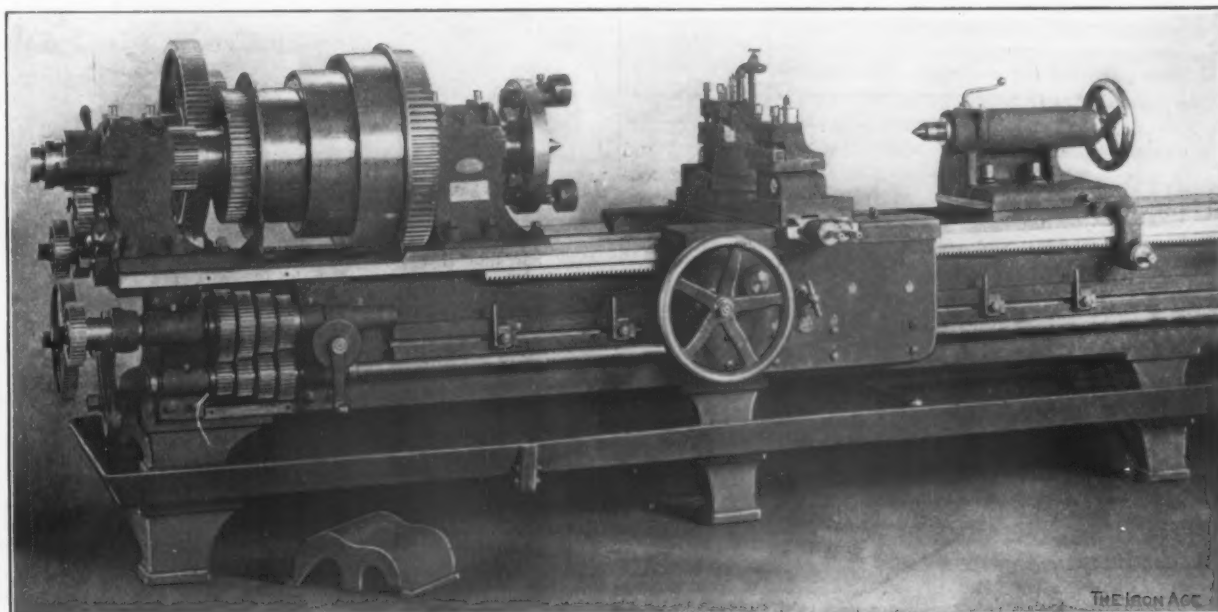
2. The greater increase for machine driven rivets in double shear over hand driven rivets; hand driven not to be hammered after getting cool.

3. The apparent necessity for deciding on a new constant in place of 1.5 for calculating the distance from

by a Rites governor. Forced lubrication is employed at about 15 pounds pressure for the interior bearings, which reduces the friction, making possible an efficiency said to exceed 90 per cent. The cylinder is tapped for indicator gear, the reducing motion for which is always in place, and is so arranged that cards may be taken without interfering with the oil tightness of the case. The generators are multipolar and of the standard type manufactured by the Sturtevant Company. They are capable of carrying 50 per cent. momentary overload without shifting the brushes or flashing at the commutator and 25 per cent. excess for two hours without sparking or undue heat.

The New Reed Special Turning Lathe.

A new 22-inch engine lathe of exceptionally strong and powerful design is now being built by the F. E. Reed Company, Worcester, Mass., to use high speed tools. An unusual feature is the making of the head stock in two parts to admit a cone pulley and gear as large as the lathe will swing over the guides. The spindle is double back geared, the first ratio being 3.25 to 1, and the second ratio 10.75 to 1. The cone pulley has three steps for a



The New 22-Inch Heavy Engine Lathe Built by the F. E. Reed Company, Worcester, Mass.

center of holes to edge of plate for rivets in double shear at first row of holes.

In closing the committee wishes to extend its thanks to O. K. Harlan, assistant mechanical engineer, Delaware, Lackawanna & Western Railroad, and J. G. Platt, engineer of tests, Erie Railroad, for the assistance rendered in making the above tests.

New Sturtevant Generating Sets.

The B. F. Sturtevant Company, Hyde Park, Mass., has added to its line of generating sets a type with simple vertical engine. In construction and equipment this is somewhat similar to the compound set of 100 kw. capacity illustrated in *The Iron Age* April 27, 1905. The simple engine is made in a range of sizes which fills in the gap between the larger capacities made in compound form and the sets of 3 to 5 kw. capacity such as were illustrated in *The Iron Age* March 30, 1905. The complete range of sizes of the new sets is from 7½ to 50 kw.

The engines are designed for continuous operation at high speed. The cylinder is an independent casting separated from the frame by a watershed partition to prevent water from the piston rod stuffing box reaching the interior of the frame. The frame itself is provided with doors which render it oil tight. The engine is provided with a balanced piston valve, and the speed is regulated

4½-inch belt, which are respectively 21, 17½ and 14 inches in diameter. In connection with a patent countershaft, which has two friction pulleys for a 5-inch belt, 18 speeds may be obtained.

A positive geared feed is provided, through which four different feeds are obtained without changing gears. The mechanism is shown with the cover removed just below the head stock in the accompanying illustration. The change of feeds is effected by a sliding spline, operated by the handle at the right of the bank of gears. This handle manipulates the spline through a pinion meshing with a rack bushing. The number of feeds may be multiplied by changing a single gear on the feed stud. With the gears furnished with the lathe, feeds of from ¼ to 1-120 inch per revolution are possible.

The lathe is equipped with automatic stops, which are secured to the front of the bed in a longitudinal dovetailed slot to arrest the carriage at various points as the work may require. After one stop has been encountered by throwing up an adjustable dog the feed will continue until the next stop acts, and so on. In this way a shaft with a number of shoulders can be duplicated any number of times without measuring the length of the cut. Two elevated tool posts are provided, each having a universal tool holder. The lathe is also equipped with a pump and pump for supplying lubricant to the cutting tool.

The Cleary-Kavanagh Furnace.

There is no need to emphasize the desirability of a furnace that will burn soft coal without emitting smoke from the stack in any appreciable quantity. Devices pur-

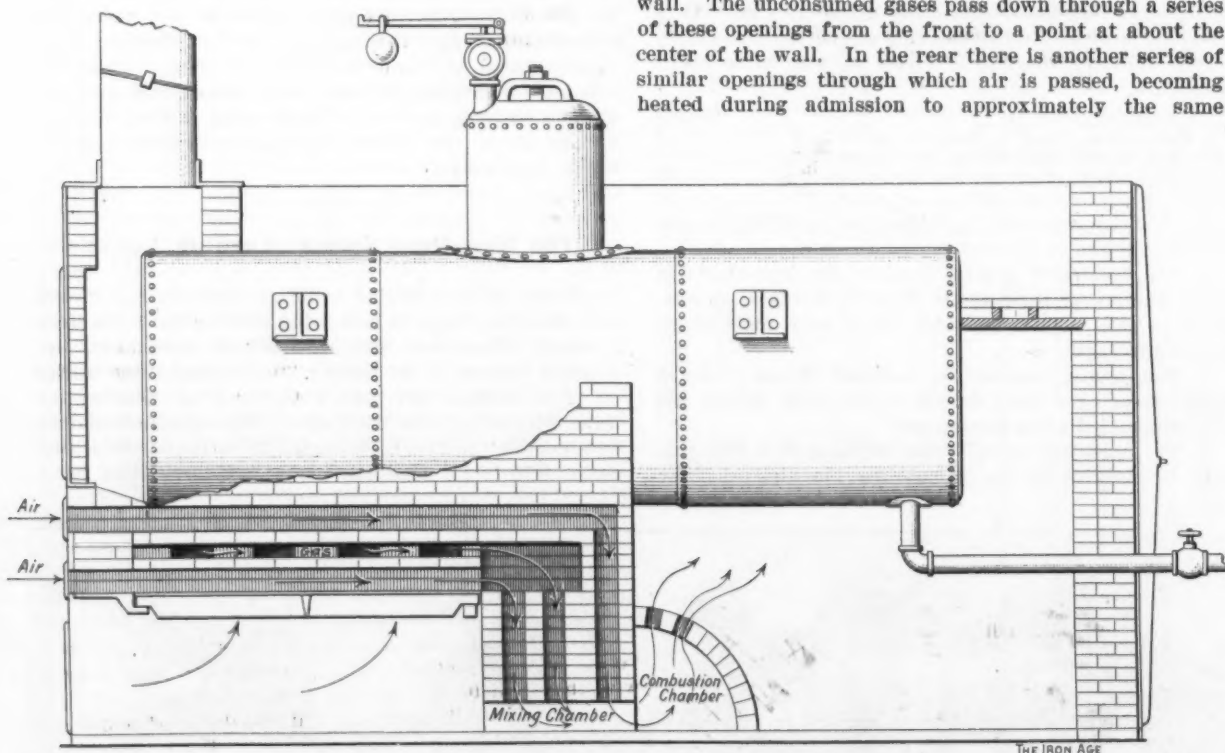


Fig. 1.—Sectional Side Elevation of Cleary-Kavanagh Furnace, Showing Air and Gas Passages and Mixing and Combustion Chambers.

porting to accomplish this have been many, but the experience with them has in so many cases been disappointing that the advent of a new smokeless furnace is invariably greeted with suspicion. There must, however, be an eventual solution of the problem, and it is always of interest to investigate the claims advanced by the designers of a new furnace.

The Cleary-Kavanagh furnace, made by the company of the same name, 44 Court street, Brooklyn, N. Y., is unique in that it is equally adapted to the ordinary grate bar or the water circulating grate bar and can be applied to a tubular or water tube boiler with equal facility. It is claimed to permit no visible smoke to escape from the stack by causing complete combustion to take place before the gases pass beyond the bridge wall. The benefits are twofold; one to the user by obtaining the best possible economy in the consumption of coal and one to the public in the abatement of the smoke nuisance. Other claims made for this furnace are that the cost of installation is small and the durability of the furnace equal to that of any bridge wall, while the cost for repairs is but little, if any, greater than with the ordinary grate bars. No cutting or mutilation of the boiler is necessary, and the time required to make the change from a furnace with the ordinary brick bridge wall to this furnace is only about two days. No changes are made in the boiler settings or side walls except the cutting of a channel each side of the fire box wall for the admission of air to the bridge wall and an opening in one of the walls for a small door to afford access for cleaning the combustion chamber. The latter does not require frequent cleaning.

In the construction of this furnace there is nothing intricate. It may be built from blue prints by any mason, and such special shapes of brick as are used are kept in stock by the manufacturers. The special shapes are more durable and cost but little more than the ordinary shapes, while the time saved in constructing the furnace with them more than compensates for the difference in cost of bricks. The application of the furnace to a horizontal tubular boiler is shown in the accompanying illustrations, fig. 1 being a longitudinal sectional elevation,

Fig. 2 an end elevation partly in section and Fig. 3 a perspective detail view with parts broken away to expose the air and gas passages in the bridge wall.

The bridge wall is provided with openings extending practically through it from top to bottom. These openings end in a series of mixing chambers directly under the wall. The unconsumed gases pass down through a series of these openings from the front to a point at about the center of the wall. In the rear there is another series of similar openings through which air is passed, becoming heated during admission to approximately the same

temperature as that of the unconsumed hydrocarbon gases. The gases and air are brought together in a mixing chamber in the rear of the bridge wall, where sec-

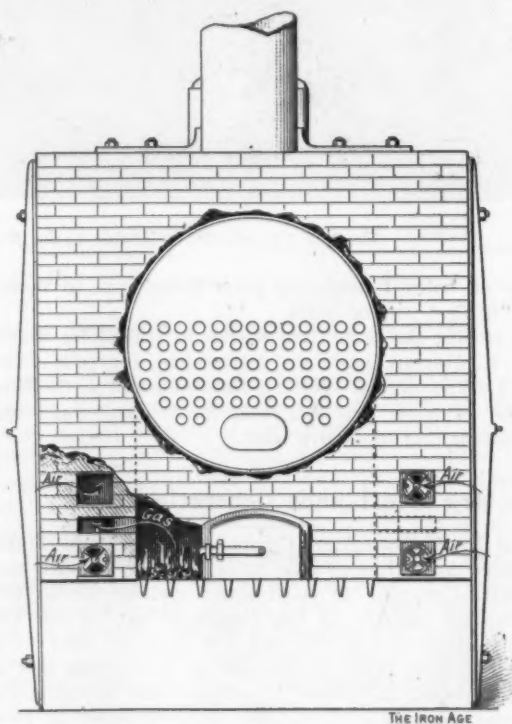


Fig. 2.—Broken End Elevation, Showing Relative Position of Air and Gas Inlets.

ondary or complete combustion takes place. The waste products of combustion containing the resultant heat then pass through vertical openings to the boiler and thence through the tubes of the boiler to the stack.

No attempt is made to retard the free flow of these gases any more than in the usual manner of burning coal. The same amount of grate surface is employed, but the combustible matter contained in the coal is more completely consumed, and the usual losses in combustible gases and exceedingly high stack temperatures are reduced, it is claimed, to the extent that it is practicable to obtain at least 10 per cent. greater efficiency from a given amount of coal than can be obtained in the ordinary furnace. Smoke, as is well known, consists of unconsumed particles of carbon, and as this carbon has heating value smoke is wasteful, to say nothing of its sanitary disadvantages and deleterious effects upon most objects with which it comes in contact.

No blower or steam jet is necessary to the perfect working of this furnace; therefore there is no loss entailed consequent upon the provision of power for such devices. The operation is dependent upon only the

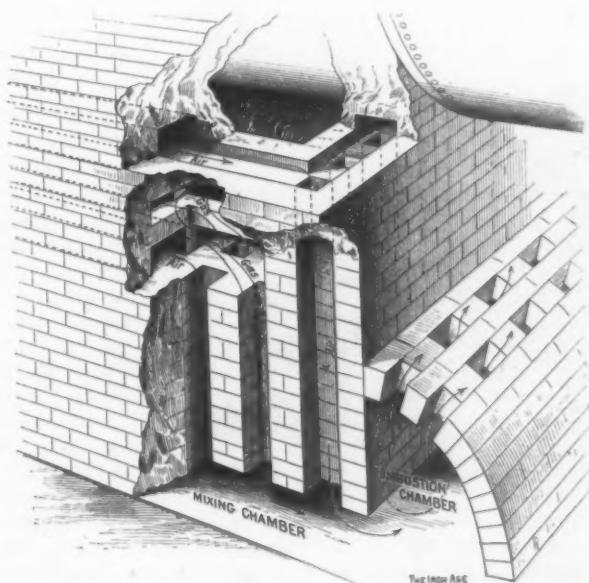


Fig. 3.—Broken Perspective Showing Vertical Passages for Air and Gases through the Bridge Wall into the Mixing and Combustion Chambers.

natural laws covering combustion, which is given as one of the reasons for the simplicity, durability and effectiveness of the furnace.

German Coke in England.

A prominent iron and steel company in the Midlands of England recently contracted for 15,000 tons of coke from German ovens. The transaction has occasioned a good deal of comment in England.

The *Colliery Guardian* takes the view that the importation by England of coke from the Continent can only be temporary, and likens it to the exportation of America's coke to France and the south of Europe, considering it merely the result of overproduction in Germany. Commenting further that journal says: "The practically universal adoption of the by-product oven in Germany has in many respects changed the conditions of coke manufacture. The production of residuals has become relatively quite as important as the production of coke. The consequence is that where a good market exists for the former the tendency will be to regard the manufacture of coke as of less importance and its ultimate disposal less a matter of concern. It is, indeed, by no means a fanciful suggestion that the coke which is now being delivered at Maryport was made from coal mined in the county of Durham! A second point to be considered is the fact that it is practically certain that in conducting this aggressive campaign German makers have been assisted by a system of preferential railway tariffs or have sacrificed their profits for the furtherance of a quantitative policy. The combination of the bounty granted by the Prussian Government on their

railways with the organized price system of the selling union of the syndicate would easily account for the presence of German coke at a British port."

The *Shipping World* considers that it is not cheap freights but the by-product oven that has made possible the incursion of German coke, and says that "it means that the Durham beehive ovens must go and that the north country producers must follow firms like Priestman & Co. and Bolckow, Vaughan & Co. and adopt at whatever cost the latest and most scientific ovens to be obtained."

Central American Notes.

SAN JOSÉ, C. A., June 12, 1905.—Some time ago this correspondence stated that Panama was no place for the average American workman, and every steamer now leaving the canal territory corroborates the statement. Malaria, fevers and the tropical sun make it practically impossible for him to work out of doors in Panama. There are men specially adapted for such work, but they are only a small percentage.

Bids will soon be asked for the building and equipment of the Panama Electric Railway, which is to be some 20 miles long. It is understood that the rails, cars and general material will be bought in the United States.

The news has come that several agents will visit these countries in the interest of the Department of Commerce at Washington. For the good of our business interests it is to be hoped that these agents are well equipped—that is, that they thoroughly possess the language of these nations (Spanish) and that they are also well versed in their peculiar ways, laws and customs; otherwise they will be of very little use to our business interests in the United States. This would be of course a great pity, because the times are ripe both at home and here for a vast extension of American trade. The Germans in Rio Grande do Sul as well as those in Valdivia are making every effort to extend their trade and influence in those sections of Spanish America, and we must allow that they do it very intelligently, and wherever they once gain a foothold it is practically impossible to oust them. They are patient, shrewd, good linguists and well up in the peculiarities of Latin American characteristics.

It is understood here that most of the lumber contracts for the canal have been awarded to companies from California, Oregon and Washington.

The canal would lose an important prop if Chief Engineer Wallace should resign, as it is generally understood that he will before long. It is to be hoped that we will not follow in the footsteps of the French, who, by eternally changing the heads of departments, helped on the ruin which finally overtook them.

Not only on the canal, but at Salina Cruz, where the Tehuantepec Railroad is building, large numbers of Japanese are to be used as laborers. Sir Westman Pearson is arranging to reconstruct both the ports of Coatzacoalcos on the Mexican Gulf and the Pacific terminus at Salina Cruz. New piers, wharves and storehouses are to be put up and many millions of tons of dredging will be needed at both ports. All this is to be for account of the Mexican Government. The Central Americans are also awakening to the need of safe ports on the Pacific, and the old port of Iztapa, near San José, is to be dredged and will probably be the terminus of the Interoceanic Railroad, which starts at Puerto Barrios on the Atlantic side. The Northern extension, under Van Horne & Keith, has rebuilt much of the road near Zacapa and is extending the line westward past San Augustin. If foreign claims (British and German) do not interfere with the Government it is probable that 1906 will see this road finished from the Atlantic to the Pacific. c.

A tariff commission is at present traveling through Australia taking evidence. It is not a commission in popular favor, according to an Australian correspondent, nor is it in sympathy with its supposed objects; still it has succeeded in unearthing some unpleasant facts and, against its will, is acting as a strong lever toward protection.

A New Nilson Special Automatic Machine.

The automatic machine shown in Fig. 1 is designed to produce ratchet shafts, used for raising and lowering the wicks of lamps, or similar articles having separate heads and shanks riveted together. Fig. 2 shows in full size a specimen of such work, this being a ratchet shaft for a lamp. The metal for the head is fed to the machine in the form of a strip, and the shank is made from wire fed in from a coil. The head is punched, stamped with the name of the manufacturer and blanked out, and is then fed to slides where the end of the wire is entered into the hole of the head, riveted, cut off the desired length and pointed at the opposite end.

The machine consists in the main of two distinct parts, a crank shaft press at the top and a straightening

the press the bottom button in the die is ejected by a finger motion and fed down a tube. In this operation the metal button makes a half turn and reaches the slide table below raised on its edge in a plane at right angles with the line of the wire, with its stamped face on the side away from the wire.

The wire, which is octagonal in section, is passed by a lever feed through straightening rolls to dies operated by slides. During the act of feeding the dies are opened sufficiently to allow the wire to pass through and at the same time be guided accurately, causing the wire to enter the hole in the button. The dies then take a firm grip on the stock, the wire is cut off and the slides, acting for an instant in the same direction, carry the wire and the head into position for the riveting and pointing, where they are held rigidly while these operations take place.

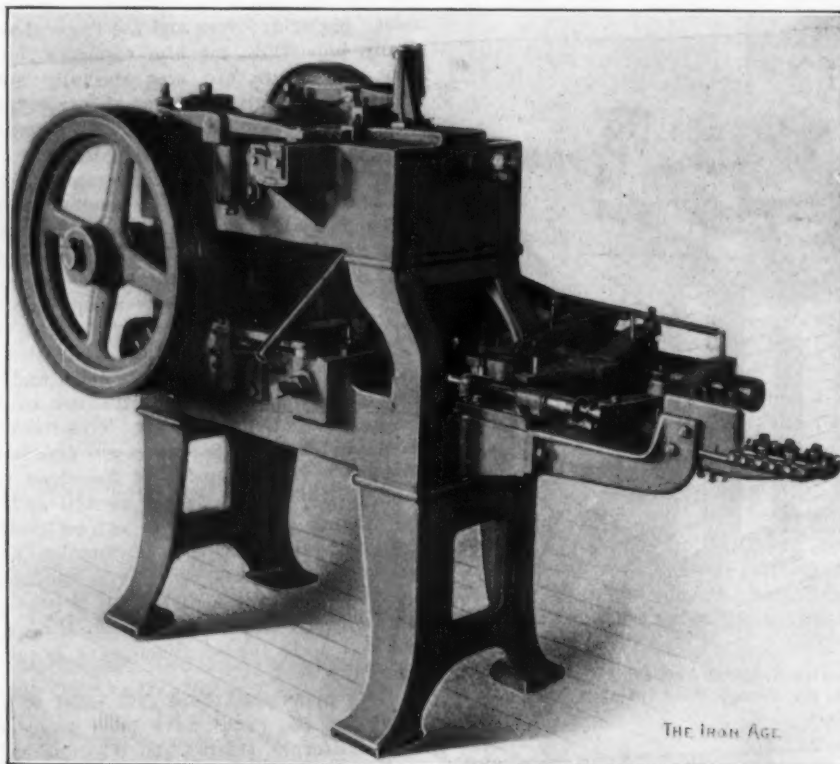


Fig. 1.—A New Special Automatic Machine, Made by the A. H. Nilson Machine Company, Bridgeport, Conn.

and double slide mechanism beneath for handling the wire and the head after the latter has left the press. The processes of punching the holes, stamping and cutting out the blanks are performed simultaneously on three pieces, the strip being fed from one die to another by a cam lever feed that takes the flat stock through the

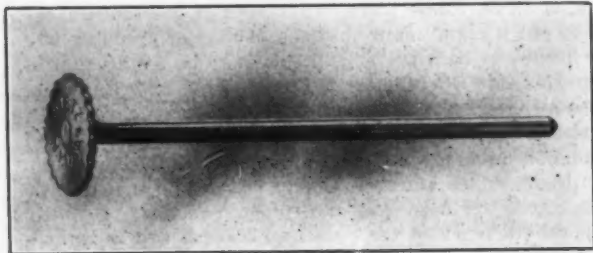


Fig. 2.—A Sample of the Work Done by the New Nilson Automatic Machine.

small slot, seen in the side of the protruding box at the top of the machine. The final stamping die is deep enough to take several of the stamped pieces in a stack, so that while the blanking-out is being performed the metal rests on several finished buttons. The bottom of the die is a spring plug under sufficient tension to permit of slight variations in thickness of the stamped pieces. If anything catches in the die a bell is sounded automatically to indicate that fact. With each stroke of

This accomplished the dies open and drop the completed ratchet shaft into a chute. The spout shown in Fig. 1, extending from the press section of the machine, carries away the scrap resulting from the punching and stamping processes.

The machine is built by the A. H. Nilson Machine Company, Bridgeport, Conn., and is capable of producing ratchet shafts at the rate of 30 a minute. It may easily be seen that there are quite a number of other articles of manufacture for which the machine can be adapted.

The Jones & Laughlin Steel Company, Pittsburgh, has installed machinery for the manufacture of spiral bars for reinforced concrete work. The machines operate on cold steel, one end of the bar being held firmly while the other end is rapidly revolved.

A great increase in the use of coal mining machinery and mechanical haulage is expected as a result of the coal mining strike in Alabama. Already mechanical mining and hauling have been introduced at several properties and other like plans are on foot.

The outing of the New England Foundrymen's Association, which was to have been held at Nantasket Beach June 21, was postponed because of the inclement weather to July 12.

Philippine Imports of Iron and Steel.

WASHINGTON, D. C., June 27, 1905.—The Bureau of Insular Affairs of the War Department has prepared a review of the commerce of the Philippine Islands, in which an interesting chapter is devoted to an analysis of the imports of iron and steel during the last decade of Spanish occupation and the five-year period since the United States took over the islands. The figures for the imports of the calendar year 1904, which are here presented for the first time, constitute a highly significant exhibit, from which it appears that the United States during the past year nearly doubled its share in this important group and now leads the world in supplying these products to the archipelago.

American Products Now Lead.

The imports of iron and steel and their manufactures for the past four years are given as follows:

Imported from—	1901.	1902.	1903.	1904.
United States.....	\$609,533	\$534,010	\$557,327	\$1,100,482
United Kingdom....	739,535	811,471	822,104	744,329
Germany	427,358	433,280	401,748	304,093
France	257,922	99,680	142,778	104,315
Other countries....	429,214	262,015	256,690	214,883
Totals.....	\$2,463,562	\$2,140,456	\$2,270,647	\$2,468,102

In reviewing the iron and steel trade of the past 15 years the bureau, referring to the theory that an increased use of iron and steel is a mark of modern progress, notes that the imports of these products have shown a distinctly progressive movement, which is especially suggestive in view of the fact that, although iron appears to have been mined and smelted in the islands from early times, yet at present consumers are dependent almost entirely upon imported materials and very largely upon imported products. The figures of the iron and steel group in the early years of the final decade of Spanish occupation show totals slightly in excess of \$500,000; during the closing years of the decade the tendency is to run in excess of \$800,000, while the quinquennial period 1900-1904 opened with values of \$1,487,686, and, with the exception of 1901, the banner year of the islands' import trade, there has been a steady gain up to the maximum total of \$2,468,102 in 1904.

During 1890 the imports of iron and steel were abnormally large, but the figures are explained by extensive shipments of railway materials for use in the construction of the Manila-Dagupan Railway, and during the following ten years the important fluctuations in the imports of these products are largely attributable to the demands of this road.

British Control of Trade.

In supplying iron and steel imports during the last Spanish decade the United Kingdom held first rank, uniformly furnishing more than half the total, and in some years more than two-thirds. This British lead has been maintained in the American period until the past year, although with a reduced ratio. In 1900 the United Kingdom controlled half the total, but in the growing volume of business during succeeding years, though absolute gains are made, her proportion of the total drops to one-third. The British iron and steel trade in 1904, amounting to \$744,329, shows a material decline in a total that has increased. This is the first year in the 15 that the United Kingdom has failed to lead and by a considerable margin.

The imports credited to the United States in 1904 aggregated \$1,100,482, or a little less than half the trade, and would indicate, if not a loss of Britain's hold, at least a future rivalry in the insular iron and steel market, which has for a long time been so completely dominated by British producers. The prominence of the United States in this trade dates from American occupation, for at no time in the last decade of Spanish control did these shipments from the United States exceed \$10,000. With imports valued at \$175,543 in 1900 and running in excess of \$500,000 during the three succeeding years, American products seriously rivaled British goods, but in the \$1,000,000 record of 1904 we seem to have the culminating conquest of the islands' market for iron and steel. While some heavy gains have been made in the imports from the United States of the principal commodi-

ties in this line, the growth has been well distributed throughout the schedules, indicating a wide diffusion of American wares and their steady increase in popular favor.

Imports of Cutlery and Firearms.

An analysis of this group in detail cannot be undertaken for the period covering the final decade of Spanish occupation and the five years under American control for the reason that the grouping has not at all times been comparable. One conspicuous exception to this, however, is found in the somewhat important item of cutlery, which can be followed throughout, and in which German imports have played a generally leading part. This trade scarcely averaged \$50,000 in the Spanish decade, but has amounted to more in recent years. Germany found during 1885-1894 an active competitor in the United Kingdom, but at the present time, with two-thirds of the cutlery trade of the islands for her own, she has no real rival. Under the head of firearms we have also an item of separate mention throughout. In the earlier decade this trade was well distributed and did not equal \$10,000 in value, with the exception of 1886, in which year Spain was credited with quite a large consignment. This trade in the past two years has assumed considerable proportions, in the past year amounting to \$58,220, almost wholly credited to the United States, and, no doubt, largely due to Government purchases in connection with the arming of the insular constabulary.

Imports During American Occupation.

In the American period the subdivision of the iron and steel group is such as to admit of review in considerable detail. One of the leading items in value is that of sheets and plates, of which the United Kingdom in recent years furnished practically all. Steel rails in 1904, amounting to \$132,507, were almost wholly supplied from the same sources, although during 1903, in a larger trade, Germany and Belgium led. Bar iron is another feature of the British imports, though in recent years Belgium has become a constant second, while in bar steel France took the lead in 1904, with the United Kingdom ranking second in a trade that had been conspicuously British in previous years. Structural iron and steel in 1904 are chiefly credited to the United States, with the United Kingdom and Belgium competitors for a remote second place in a trade that in previous years was almost entirely British. The miscellaneous tool schedule represents considerable value and we find this trade divided with singular uniformity between the United Kingdom, Germany and the United States up to the present year; but in the increased total of \$128,355 in 1904 the United States is credited with a considerable lead over her former competitors. Much the same experience has attended the wire nail trade with the same countries as participants, though the United States has developed gradually into control of half of this \$30,000 trade. In the boiler trade of about \$70,000 a year the United Kingdom has enjoyed a prominent place since 1900, subject only to irregular competition from the United States; but in imports of pipes and fittings, which have increased rapidly since 1900 and represent a total of \$121,948 in the present year, the United States has strengthened her lead until she now contributes 90 per cent. of the whole.

American Machinery Pre-eminent.

In the various machinery imports the United States at present holds a pre-eminent position. The American printing press, cash register, typewriter, locomotive and stationary engine seem to have found such favor as to practically exclude all others, and the same may be said of American electrical and pump machinery. Sewing machine imports have largely been in the hands of Germany, and the banner year of this trade, 1901, showed the considerable total of \$167,712, but in the decline to the present year the German machine has not held its former position, and the American article, second in insular favor since 1900, is a closer competitor than ever before. American safes, cook stoves and scales and balances, however, have no such contested field before them, and in the aggregate of this trade for 1904 of nearly \$30,000 their popularity is proved largely to the exclusion of all others.

W. L. C.

lurgical engineer and the mechanical engineer have worked together to cheapen it so that the civil engineer could employ it more freely. It is safe to predict that a large factor in the steel tonnage of the future will arise from uses which are optional to-day, but which public sentiment will then make compulsory.

The Position of the Steel Foundry.

The steel casting industry in the United States has had not a little attention in recent years. Manufacturers of gray iron and malleable castings have been hearing from time to time of the substitution of steel for their products and there has been also some use of steel castings instead of forgings. However, an examination of the statistics of the industry would indicate that perhaps undue importance has been attached to the effect of the displacement of gray iron and malleable castings by steel castings. It is true that cast steel frames for locomotives are taking the place of forged frames, and that this means 5 tons of steel castings for the average locomotive. It is true, also, that draw bars are now largely specified to be steel castings instead of malleable castings, and that car bolsters and center plates and wheel centers come from the steel foundry. It is well known, moreover, that steel rolls and housings and other steel castings are increasingly in use in rolling mills. In the discussions on the inroad of steel upon gray iron these facts have been given prominence and the deduction has been made that gray iron and malleable castings have a steadily narrowing field.

The statistics of the American Iron and Steel Association show that the production in the past five years of the various classes of steel castings has been as follows:

Production of Steel Castings in the United States.—Gross Tons.

	1900.	1901.	1902.	1903.	1904.
Acid open hearth	134,847	206,681	255,475	265,469	203,915
Basic open hearth	42,644	94,941	112,404	134,879	98,919
Bessemer	6,467	6,764	12,548	18,099	16,051
Crucible	3,989	3,927	4,955	5,409	4,308
Miscellaneous ..	4,856	5,257	5,553	6,409	7,018
Totals	192,803	317,570	390,935	430,265	330,211

It will be seen that the falling off in 1904 from the high record reached in 1903 was marked, being no less than 23 per cent., and that the output of steel castings last year was but little more than in 1901. There are no statistics of the production of gray iron, chilled iron and malleable castings, but some comparison can be made between the two years by taking the production of foundry and malleable Bessemer iron. For 1903 the production of foundry iron in the United States was 4,409,023 gross tons, and of malleable Bessemer 473,781 tons. Last year the production of the two classes of iron amounted to 3,827,229 tons and 263,529 tons, respectively. This indicates a decline of 16.2 per cent., but stocks of iron were less on December 31 than on January 1, 1904, so that the actual falling off in the production of gray iron and malleable castings last year as compared with 1903 was probably less than 15 per cent. The greater shrinkage in the steel castings trade was largely due doubtless to the failure of railroad demand last year. Another noteworthy feature of the statistics is the relatively small tonnage of Bessemer steel castings produced in the United States. So much has been said about the rapid introduction of the small Bessemer converter in steel foundries that it might be expected to have made a larger impression upon the industry. But as the small converters are employed as a rule on small castings calling for high heat and fluidity in the metal, tonnage does not count up rapidly. The average for 1900 and 1901 was nearly doubled in 1902

with an output of 12,548 tons, then increased about 50 per cent., to 18,099, in 1903, and fell back to 16,051 tons in 1904.

But perhaps the most striking impression that will be obtained from the figures is that of the relatively small proportion of the total of castings produced in the United States that comes from steel foundries. It is probable that not more than 6 per cent. of the total of iron and steel cast in sand molds in 1904 was steel.

In recent months the steel casting industry has shown a good recovery from the stagnation that especially marked it in 1904. From the 2-cent level, touched at the worst of last year's depression, prices have advanced materially, and are now in some cases 75 to 100 per cent. above low point. However, there are indications that the country has ample capacity to care for its needs in the immediate and even more remote future.

Do Safety Appliances Increase Accidents?

A writer in an English engineering journal draws the deduction from an increase in the number of reported accidents in industrial establishments that "a man's best chance of immunity rests in his own vigilance, and that is destroyed by hemming him in with artificial protection." In other words, the argument is that the growing use of safety appliances designed to reduce the danger of accidents to the minimum operates in exactly the reverse manner and tends to increase the danger. The theory is based on the statistics of such accidents in Great Britain in the years 1897 and 1904. In 1897 the killed numbered 513 and the injured 35,000. In 1904 the killed numbered 721 and the injured 78,000. The increase was a notable one on the face of the returns, particularly in the number of injured. Yet it seems a pretty severe arraignment of the expensive and determined effort to rid manufacturing employment of its dangers to lay the blame at the door of the means of accomplishing a purpose so laudable.

There must be other and better reasons. Perhaps there is some truth in the argument advanced by the English writer, but if this be true the increased danger from the overconfidence of some careless workmen is as nothing compared to the great gain to the working people as a whole. Probably the aggregate of employees taken into the statistics was greater in 1904 than it was seven years previously. Perhaps the returns were more complete, including a greater percentage of less serious accidents. Various elements must enter into the comparison of great totals such as these. Probably a very important element is the different manner in which the British workman labors as compared to what he used to do. Undoubtedly more pushing methods are becoming strongly entrenched in British factories and workshops. There is greater concentration in his work, in the effort to procure a greater and more economical production. The old deliberation is being replaced by a greater zeal and haste. Where men work rapidly there is less caution as to risk of accident.

To carry out the line of argument against the safety device, the workman would not be completely careless of his life and limb until the safety device had removed all possible danger. But it does not do this. It simply removes danger wherever it is possible. It is absurd to say that it is an added source of danger to inclose gearing so that coat sleeve or hand cannot be drawn into it. And because this danger is removed the workman does not learn to disregard the dangers of a similar menace which from its nature cannot be protected. There must

always be danger where there is machinery. The workman knows it, and it is impressed upon him time and time again by his foreman or superintendent. He is as cautious as his nature will permit. A careless man or woman must run the additional risk attendant upon this mental failing. But it is a lesser danger than in the days when the safety device, now applied in a great many ways, was brought into common use. No one supposes that the railroad employee encounters the same danger to-day that he did before the automatic coupling came into general use, and every factory now has safety appliances quite as important. Greater concentration in the work in hand may cause an increase in the percentage of accidents, but we must doubt if that increase is nearly so great as it would be under like conditions of labor, but with the same absence of safety appliances as existed not a great many years ago, when the only protection of the workman was his natural sense of caution.

CORRESPONDENCE.

Puddled Iron versus Steel.

To the Editor: Mr. Speller's article in the issue of June 15 has been read by me with much interest. In closing the discussion with Mr. Speller, so far as I am concerned, I will say that the test of use will determine whether iron or mild steel is best adapted to resist corrosive influences, to hold protecting material and to resist shock, and nothing that Mr. Speller or I may say and nothing which laboratory experiments may indicate will in the slightest degree alter the facts. I may say, however, that he ignores the fact that what he terms "uncertain conditions" are the working conditions; hence to ignore them is simply begging the question.

The photomicrographs given by Mr. Speller are well selected from the standpoint of an advocate, but they are not broadly representative.

The examples of the relative longitudinal and transverse strength of iron plates given by Mr. Speller represent a type only and again illustrate his position of advocate. The longitudinal and transverse strengths of charcoal iron approach each other more nearly than is common with iron made from puddled pig, but much depends upon the character of product and the manipulation necessary to make such product. For example, muck bar piled and rolled wholly in the longitudinal direction will give high longitudinal and low transverse tests; whereas muck bar piled and rolled equally in the two directions, at right angles to one another, will give approximately the same results in both directions.

The bending mentioned by Mr. Speller indicates nothing more than efficient appliances and skillful operators, as it is well known that many bedsteads are made from tubing not welded at all and bent cold without distorting the section or increasing the width of the parting.

JAS. P. ROE.

POTTSTOWN, PA., June 26, 1905.

Following the announcement that the W. & A. Fletcher Company, Hoboken, N. J., has taken the contract for a turbine steamer for the New York-Boston service comes the statement that the management of the Eastern Steamship Company has completed plans for the construction of a turbine steamer to be used in coastwise shipping. She is to be built at the Connecticut yards of the Eastern Shipbuilding Company, and her builder guarantees a speed of 20 knots per hour.

In keeping with the plan adopted two years ago of distributing annually a bonus the American Smelting & Refining Company has paid to its employees about \$200,000. The distribution is made on the basis of a percentage of the surplus earnings. This year's bonus amounts to about 15 per cent. of the earnings of the company in excess of \$7,500,000, which indicates that the company during the year earned about \$8,800,000 all told.

Iron and Steel in Bridge Building.

C. C. Schneider, president of the American Society of Civil Engineers, had for the subject of his presidential address at the annual convention of the society at Cleveland, June 20, "The Evolution of the Practice of American Bridge Building." From that portion of the address which relates to the materials of bridge construction we make some extracts below:

Early Iron Bridges.

The first bridge in America consisting of iron throughout was built in 1840 by Earl Trumbull over the Erie Canal, in the village of Frankfort, N. Y. In the same year Squire Whipple also built his first iron truss bridge. Probably the first iron railroad bridge was built on the Philadelphia & Reading Railroad at Manayunk, Pa., by Richard B. Osborne, chief engineer, in 1845. It was a double track through bridge, of 34 feet clear span, of the Howe truss type, with cast iron top chord and web braces, the bottom chord and vertical web members being of wrought iron. This bridge was followed by several others of the same type.

When American engineers began to build iron bridges they paid little attention to the then existing European models, but preferred to develop their own systems independently, as they had done previously with wooden bridges, the first iron bridges being imitations of the Towne lattice and the Howe and Pratt trusses. All the earlier bridges were built principally of cast iron, wrought iron being used in tension members only. In the first iron viaduct built by the Baltimore & Ohio Railroad, in 1852, all parts were of cast iron except the tie rods. The wrought iron tension members at that time usually consisted of round bars with screw ends or elongated links made of square bars. Later these links developed into forged eye bars, introduced by J. H. Linville in 1861. These eye bars have since become one of the distinctive features in American bridge construction. Although flat eye bars were used in Europe at an earlier period, in chains of suspension bridges and in some types of trusses, they did not find favor there and were soon discarded for structures with riveted connections.

The first bridges made entirely of wrought iron were those of the riveted lattice type which Howard Carroll, then assistant to George E. Gray, chief engineer of the New York Central Railroad, commenced to build in 1859; next came the plate girder type, the first of which was built by E. S. Philbrick for the Boston & Albany Railroad in 1860.

The bridge built by J. W. Murphy in 1863, over the Lehigh River at Mauch Chunk, for the Lehigh Valley Railroad, was the first pin connected bridge constructed entirely of wrought iron in its main members, cast iron being used only for joint boxes connecting the compression members. Many bridges of similar construction were built after this, but it was not until after the failure of the Ashtabula Bridge, in 1876, that cast iron was entirely discarded as too unreliable a material to be used in any parts of a railroad bridge.

The year 1873 marked the beginning of the inspection of structural iron work. Before that time the St. Louis bridge was probably the only one on the construction of which inspectors of material and workmanship were employed.

After iron railroad bridges had been in service for about 20 years engineers who had charge of their maintenance noticed that weak points developed under traffic, particularly in the details and connections. It also became apparent that the bridges built up to about 1875 were deficient in rigidity and lateral stability, and improvements were gradually made to remedy these defects, producing more massive construction, fewer and heavier parts and a more extensive use of riveted connections. The pin connected type of truss for short spans was gradually discarded, the plate girder and riveted truss taking its place, and the limiting length of spans for these types was gradually increased. Specifications for iron bridges were also revised and improved; those prepared in 1877 by Charles Hilton for the Lake Shore & Michigan Southern and by C. Shaler Smith for the Chicago,

Milwaukee & St. Paul Railroad and in 1879 by Theodore Cooper for the Erie Railroad being steps in that direction.

The First Steel Bridges.

Steel as a structural material was first used in a portion of the St. Louis bridge, completed in 1874, but the first bridge built entirely of steel was the Glasgow bridge, over the Missouri River, completed in 1879. The extensive use of steel, however, did not commence until 1890. Before that time steel was used only in isolated cases, or for heavy work, such as chords and eye bars for large spans.

About 1890 some railroads commenced to build also smaller spans and plate girders of steel, and for eye bars steel was almost exclusively used. At that time most of the rolling mills which had formerly manufactured wrought iron were equipped with steel furnaces, but continued for some time to make both kinds of material, until they found it more profitable to confine themselves to the manufacture of structural steel only and discontinued the manufacture of wrought iron. In 1894 it was practically impossible to obtain wrought iron shapes, and from that time forward steel entirely superseded wrought iron as the modern structural material. The year 1894, therefore, may be considered as the commencement of the present epoch—the steel age.

The use of steel in the construction of modern bridges and the improvements made in its manufacture, thereby reducing its cost and increasing its reliability, have made it practicable to build structures of a magnitude never attempted before. Its introduction as a structural material had a marked influence on the progress and development of bridge building. Certain types of construction and details which have proved unsatisfactory have been discarded, and others which have undergone a process of purification and improvement have survived. Rational types of construction and details are now established and have become the recognized standards for ordinary bridges of moderate spans. The present tendency is toward uniformity, and to-day there is but little difference between the designs made by competent engineers. This tendency toward uniformity has also been extended to specifications for bridges and other steel structures, relating to quality of material, workmanship and unit strains. As late as five years ago the requirements specified for the quality of steel were numerous, almost every railroad or bridge engineer requiring some different grade and sometimes several different kinds in different parts of the same structure. Erratic specifications are now gradually disappearing, and engineers at the present time are nearly all agreed on the grade of steel best suited for structural work.

There is also at present more uniformity between the designs made by American engineers and those by European engineers. In the early days of iron bridge building in this country there was little resemblance between American and European structures. Each country gradually adopted the good points of the other's practice; we adopted their practice in the use of riveted trusses for longer spans and a more extensive use of riveted connections, while the European engineers are adopting the more rational designs and details of plate girder and riveted truss construction now used in America. At the present time the designs of plate girders and ordinary riveted truss bridges made in this country are almost identical with the designs made by the best bridge engineers in Europe, so that no vital difference now exists between American and European bridges of moderate spans.

Still Heavier Bridges in the Future.

The steady increase in the weights of locomotives and rolling stock has been the cause of constant replacements of iron and steel railroad bridges by heavier structures. As the extreme limit of loads may not yet have been reached, the probable future increase should be anticipated in designing new bridges which have to carry any kind of railroad traffic. While it is impracticable to provide for all possible emergencies, railroad bridges should be designed to withstand the ordinary contingencies of traffic, such as derailment, a broken axle or a collision on the bridge. Structures designed in accordance with good

practice may be damaged by such accidents, but should be able to stand up without collapsing. As steel is practically an indestructible material, if kept from corrosion, there is no good reason why properly designed steel bridges, properly protected, should not last at least as long as stone bridges in this climate.

About 1886 a new type of iron structure came into existence—viz., the iron skeleton construction for buildings—which has opened a new field for the structural engineer. The designing and construction of the structural part of these buildings has now become an important branch of engineering. Any engineer who has followed the progress of American bridge building for the last 35 years must have observed that not only the designs but also the methods adopted for accomplishing results have undergone a vast transformation, while abroad the designs have been improved, but the methods have changed very little, if at all.

Engineers and Manufacturers.

Most of the largest bridges and other steel structures which have been built in later years have been designed by engineers not connected with manufacturing establishments. The manufacturer should confine himself to his legitimate field of manufacturing structural steel work at so much a pound. The line between engineers and manufacturers will be even more marked in the future, when the same distinction will prevail as now exists between the architect and the contractor. The manufacturers of structural work in the future will devote their energies to improvements in their tools and machinery and methods for handling material. Their engineering force will consist of mechanical experts, shop draftsmen and engineers, who, with a thorough knowledge of shop practice, are skilled in putting the engineers' designs into convenient shape for the workshop.

Patents on structural designs and details, as well as on special shapes, have become unpopular. Designs of important structures or those with new features are now generally published for the benefit of the profession, and each engineer endeavors to improve upon the design of the other.

Nickel Steel.

Nickel steel has of late received special attention and has been investigated by engineers in relation to its usefulness as a structural material. For many years metallurgists have experimented on the effect of the addition of special metals to steel with a view to increasing the ultimate strength and elastic limit of the steel without proportionately decreasing its ductility. So far, as a special structural steel nickel steel is the only one which has proved satisfactory.

Nickel steels of varying carbon and nickel have been successfully used during the last 15 years for marine and stationary engine shafting, locomotive axles, piston rods and crank pins and a wide variety of forgings and castings for parts of machinery. Its application for the manufacture of armor plate since 1890 is well known. It has recently been adopted, especially in this country, for gun forgings. It has been proposed for structural work before, but is now actually used for bridge construction in the eye bars for the Blackwell's Island cantilever bridge across the East River, New York City, and may take an important place as a structural material for long span bridges.

Concrete Construction.

Concrete construction has been in use for many years, but is used more extensively now than formerly for foundations, piers and abutments as well as for bridges. Marked progress was made in concrete construction when the methods of reinforcing concrete with steel were introduced. Concrete arches reinforced with steel ribs or bars, properly designed and constructed, have proved satisfactory for highway as well as railroad bridges and are gradually superseding those of masonry construction.

Reinforced concrete is now used successfully in the construction of floors of bridges and buildings. It has also proved satisfactory for fire proofing and as a protection to the steel work of bridges over railroad tracks against the corroding influence of the gases from locomotives, and will probably take a permanent place in structural work in the future.

Activities in Canada.

Kootenay's Prospects Brighten.

TORONTO, June 24, 1905.—As a result of negotiations which had been under way for some time and which were concluded yesterday in this city the control of three important mining properties in southeastern Kootenay, British Columbia, passed from the hands of a Toronto group into the possession of parties connected with the Canadian Pacific Railway Company. The properties in question are the War Eagle mine, the Center Star mine and the St. Eugene cluster of mines. The War Eagle and the Center Star are gold mines and the St. Eugene mines are silver-lead producers. All were controlled by George Gooderham and his son-in-law, T. G. Blackstock, both Toronto men. Mr. Gooderham died some weeks ago, leaving an estate valued for probate at \$9,000,000. His death, owing to the necessity of eventually distributing his property, forced these mining shares upon the market. Evidently the Canadian Pacific Railway Company was ready to extend the sphere of its financial influence over the mines, which were in the strictest sense of the word tributary to its lines and to its smelting and refining works at Trail.

Though the War Eagle and the Center Star had been closed for a long time on account of profits being negated by the charges for labor, freight and smelting, the Canadian smelting works at Trail have kept in operation. The works were improved greatly after passing under the control of the Canadian Pacific Railway Company. They were equipped for the treatment of both lead and copper ores. Within the past two years a lead refining plant and a plant for manufacturing lead sheets and lead pipe have been added. The refining works at Trail are the only ones in the Province.

In the property known as the St. Eugene mines are consolidated all the claims on the western slope of the hill at Moyle on the well-known St. Eugene lead. The St. Eugene company has a concentrator, one of the largest, if not the very largest, in British Columbia. It is also probably the best equipped and most economical. The ore as mined carries about 6 or 8 ounces of silver and 13 to 14 per cent. lead, which is turned in the company's mill into a concentrate running 33 ounces silver and 66 per cent. lead. The lead bounty raised these properties out of a state of inactivity into one of productivity. The St. Eugene mine of the group is the largest lead producer in the Province. Last September, when the mine was officially inspected, it was keeping 273 men busy.

There is every prospect of an important revival of mining enterprise in the southern Kootenay country as a result of this transfer.

Canadian Employers May Import Labor.

Judge Anglin's decision that Canada's Alien Labor act is *ultra vires* of Parliament may not pass unchallenged, though appeal from it appeared to be precluded by the nature of the legal procedure out of which it issued. The Dominion Government is unwilling to have the law collapse as the result of an ordinary application for a writ of *habeas corpus*. If there is any way of getting the act on all fours again, so to speak, and have the decision run the gantlet of the Court of Appeals, the Supreme Court and possibly the Judicial Committee of the Imperial Privy Council, the court of final jurisdiction in the empire, the Government will probably begin the process. In the meantime the act is treated as dead. Canadian manufacturers are no longer constrained by it. They or their agents are, at least temporarily, free to go to the United States or elsewhere and there contract with men to come to Canada to do work of a specified kind for a stated rate of wages.

This freedom is of advantage to Canadian employers, who find a scarcity of skilled labor. Especially difficult has it been to get men for the new iron and steel plants. Such industries, being the first of the kind in the country, had no trained body of citizens to draw upon. The law put no obstacle in the way of an alien coming into the country and finding employment on his own venture. As a result of such voluntary immigration the works at Sydney and at Sault Ste. Marie were manned.

If Judge Anglin's law is good it is not easy to see how an alien labor statute can be valid, no matter by what legislative authority enacted. For every country's power is limited, as Canada's is, to its own territorial bounds. Hence if Canada is not competent to enforce a law of deportation because the enforcement necessarily calls for the imposing upon aliens of Canadian restrictions outside of Canada, then no country can have a law of deportation.

Bounties and the Budget.

It was expected that the budget would be brought down on Thursday, but contention over other matters carried the House past that day, and it is now unlikely that the Finance Minister will present his statement before the middle of next week. Two changes confidently expected are an increase of the duty on binder twine and the placing of cream separators on the dutiable list. There appears to be a notion too that the bounty plan will be modified, not by changes made immediately, but as a result of a reference of the tariff to the commission Mr. Fielding is to name in his budget speech. The bounties are tapering off and will expire in three years. It is believed that another mode of aiding the iron and steel industries will be worked out. It is somewhat significant that the *Halifax Chronicle*, a newspaper in which the Finance Minister is believed to have still a proprietary interest, and which certainly is a stalwart supporter of his, should speak in the following terms of dissatisfaction with the present policy of permitting the use of imported ores in bounty fed iron works:

We hope the Federal Government and the Executive of this Province will determine that Nova Scotian iron ore must be consumed in larger quantities at local furnaces, which have drawn \$461,540 from Canada during the fiscal year 1902-03 and \$100,583 from the Treasury of Nova Scotia during the four years ending September 30, 1904. That these State aided furnaces would neglect the iron fields of this Province to the present extent could not have been foreseen. . . . The encouragement of iron mining in this Province does not present any difficulties that we can discover, and in any readjustment of the fiscal system we hope that the welfare of our iron mining industry will be promoted.

Dominion Steel Affairs.

Rumors having been sent abroad that a reorganization of the Dominion Iron & Steel Company's finances would be effected, the conversion of the 7 per cent. cumulative preferred stock being one of the changes prognosticated, the *Sydney Post* published the following editorial on Wednesday:

We are authorized to state on the highest authority that the proposed issue of steel stocks mentioned in our Montreal dispatches published yesterday refers, as said therein, to a street rumor and there is under discussion by the board of the steel company no plan for a readjustment of its stock issues, and that while the present management is in control of the affairs of the company no plan will be presented to the preferred shareholders which will not fully safeguard their existing rights.

The interest of this community is not alone in the manufacturing side of this enterprise. Many people invested in it. The employees of the company were offered the opportunity to buy preferred stock on deferred payments, and that there should be no envy felt by these in the closely allied company the same privilege was extended to the officials of the coal company. Many availed themselves of the offer and bought the stock at 85. Indeed this stock is largely owned by small holders scattered over the country, who bought it on the basis that it gave them a lien on the earnings of the company prior to that of the holder of the common shares, and for that reason alone the public paid at the time of issue \$85 a share for preferred and \$15 a share for common. In other words, the value of this prior claim to dividends made one class of stock nearly six times as valuable as the other, although in voting power one share has the same value as the other. Dividends are in arrears on the preferred, and it would suit admirably the speculator who is looking for the lamb to buy common steel from him to create the impression that the board is about to despoil the preferred shareholder of what belongs to him. This will not be done.

The company has notified the Trade and Commerce Department that the manufacture of steel rails will begin at Sydney in a few days. The capacity is 50 tons per ten hours.

Notes.

The Nova Scotia Steel & Coal Company has advised the Trade and Commerce Department that the manufacture of steel ingots will be begun at its Sydney Mines works early in July. The plant there consists of one blast furnace of 200 tons daily capacity and four open hearth furnaces.

Plumbers who do not belong to the Plumbers' Association have appealed to the Minister of Customs to refrain from enforcing the duty on imports of their supplies. They maintain that owing to an understanding between the association and Canadian manufacturers of supplies nonmembers of the former body cannot get domestic goods at a fair price and accordingly have to depend on imports.

John Robertson of the Climax Good Roads Machinery Company, Marathon, N. Y., has asked the Council of Peterborough what inducements it could promise his company to establish works there. Besides road machinery, structural steel shapes would be manufactured.

On July 5 the rate payers of St. Catherine's, Ont., vote on a by-law to give certain privileges to the Jenckes Mfg. Company to establish works in the city. A site, sewer connection and tax exemption for ten years are the privileges.

The Western Construction Company has been incorporated under the Dominion law with a capital of \$4,000,000; headquarters in Toronto. C. A. C. J.

Electric Power in Mesaba Mining.

DULUTH, MINN. June 24, 1905.—An effort is to be made at once to supplant steam by electricity at the mines of the Mesaba range. The Great Northern Power Company, whose great plant near this city is well under way, and which should have its wheels in motion in less than a year, is now investigating the matter and has its general manager working out the plans. There is a great field for the use of electrical power on the Mesaba. Between Hibbing and Sparta, a distance of about 36 miles measured along the line of the ore bearing formation, there are 52 operating shafts and more heavy steam shovels. Many of these shafts are pumping heavily and steadily, several of them up to 1200 to 1500 gallons a minute. None of these operations is more than 55 miles from the company's power station at Duluth, measuring in a direct line. At Buhl a very heavy electric stripping installation is going in, to be operated late this fall or early next year, and if this is as successful as is expected by the owners and engineers it is sure to be followed by others of a similar character and the field of stripping will be extended to greater depths of overburden. East of Sparta, on the same range, and fully as well located for taking power from these works, are eight or nine shafts now in commission, several of them heavy pumps, and west of Hibbing there are now five and a number more planned for immediate development. On this western part of the range, too, will be a considerable power for concentrators and surface pumping. At Soudan and Ely, Vermillion range, are ten deep shafts, some of them down to 1000 feet, and all big producers. These are further from the source of power than any of the Mesaba properties, but not too far for economical distribution. While it is by no means impossible that electricity shall be substituted for steam in the movable steam shovel, it is not probable that efforts in this direction will be as urgent as to replace steam engines by motors at shafts and in pumps.

There is just now on all ranges and in the copper region of Lake Superior a very considerable increase of interest in electrical mine power, and at several points important installations are in progress or are soon to begin. At the sixty-first level of the Quincy mine, No. 7 shaft, the ground has been very troublesome and has had a tendency to come together, which has bothered the management for some time. There a development interesting to both miner and engineer will probably take place. Three or four installations are planned for Ishpeming and vicinity and several for the Menominee range. One of these latter represents a cost of about \$250,000. It will be possible to give details of all of these soon.

A New Mine Deal of Interest.

The Hobart Ore Company of Cleveland, in which Gustav Von De Steinen is interested, and which is owned

by parties already having some small mines on the Mesaba, has just bought the southeast quarter of the northwest quarter of section 25, T 58, R 17, adjoining the Pettit mine, and near Sparta. The price supposed to have been paid is \$100,000. This mine shows about 3,000,000 tons of ore running 57 per cent. iron and about 0.075 per cent. phosphorus, with a royalty somewhat mixed; but it would average for the entire ore body about 23.5 cents a ton. This shows a bonus of about 3 cents a ton on a non-Bessemer ore running fairly well in iron that will have to be mined underground and will be very wet. The surface varies from 60 to 165 feet, and the ore varies in thickness from quite thin to more than 200 feet. It lies in the northwest corner of the 40, and the whole property may show an additional tonnage when thoroughly explored. The contention that has been made in this correspondence as to the change in character of ore accepted by buyers is well known in this sale, which would not have been considered a few years ago, but is now looked on as a good purchase.

The Deerwood Range.

There is a great deal of talk in reference to the Deerwood range, so-called, west of Duluth, on the line of the Northern Pacific Railroad, and quite a boom is developing in lands there. The early comers in the district have made a good deal of money, or can do so if they take advantage of their present opportunities. All sorts of tales are going the rounds, and some very flattering statements have appeared in print. But I have not been able to change the opinion I have had from the beginning and have given in *The Iron Age*. I take it that while iron ore exists there in some quantity it has not so far developed into anything of a profitable nature so far as mining is concerned; that the presence of a considerable tonnage of lean ores, while it gives a promise of something better, wherever conditions for a better concentration may have been present, does not guarantee this, though it gives abundant reason for a thorough examination and exploration of the region along scientific lines; that the ore so far driven into is high in manganese, silica and phosphorus, and gives from 20 and 25 per cent. in iron to about 40 and even 50 per cent. in some cases; that the better ores that have been occasionally found are in rather narrow seams; that the surface indications of float, ochre and paint rock cover a width across the trend of the supposed formation as great as 6 miles and an extreme length of 60 to 70 miles, or from the city of Brainerd to points many miles east of Aitkin, and that this wide area of possible formation may militate against close concentration anywhere throughout its extent.

The interest excited by the talk about Deerwood and the high prices demanded for acreage there has stimulated speculation elsewhere throughout northern Minnesota, in regions where the possibility of iron ore is about as remote as that of vegetation in the moon. This week the State has issued mineral leases in central Cass County, some 25 miles north of the Deerwood district and 50 miles southwest of the most westerly exposure of the Mesaba formation. It is in the center of a great expanse of modified drift, undulating till and terminal moraines, without a rock exposure for 50 miles in any direction, and of course exploration there is the wildest speculation and the merest guesswork. Just east of Leech Lake, in the same sort of region, and 20 miles west of the most westerly exposure of the Mesaba formation, other leases have just been taken up. The theory on which these leases are operating is of course that where the Mesaba formation disappears beneath the drift west of the Mississippi it does not end, but extends indefinitely, and that if they can find its continuation they will be amply rewarded. And possibly they will if they can find it, for they have in their favor the fact that Mesaba ores were before glaciers. Against them, to be sure, is that other important item, that concentration of these ores on lower levels, such as where they are working, was imperfect. This is well shown by the finds on that part of the Mesaba range west of, say, Nashwauk. All search that has been made in the past west of the pitch of the Mesaba formation beneath the drift has been unavailing, and there is absolutely nothing to guide the

explorer, for in that region the presence of jasper float is no indication at all.

A Mexican Iron Ore Development.

John W. Gates, Charles H. Foote, Joseph Sellwood and their Eastern associates, who own a large iron ore property in the State of Guerrero, Mexico, intend to take up the matter of development at once. They purchased a tract of about 1,000,000 acres and have now engaged Capt. James Cundy, well known in the Lake Superior region as a mining man of intelligence and skill, to take the development of the land in charge. He leaves Iron Mountain for Guerrero and will begin work at once. The tract bought includes a great iron mountain, containing an immense tonnage of Bessemer ore of good grade and easily mined.

D. E. W.

New Publications.

The Mechanical Handling of Material.—By George Frederick Zimmer, A. M. Inst. C. E. Publishers—New York: D. Van Nostrand Company; London: Crosby Lockwood & Son. 8vo. Pages, 521. Illustrations, 550. Price, \$10.

The author set out to furnish a treatise on the mechanical handling of material, such as ore, coal, timber and grain, and has produced a work that is a monument to patient and protracted investigation in an important engineering field. His book deals with the handling of the classes of material referred to by the use of automatic or semiautomatic machinery, together with the accessories employed in the manipulation of such plant. Mr. Zimmer's starting point was flour milling, and from a study of the different operations of handling in that connection and the compilation of capacities and speeds of elevators and conveyors for the purpose of standardizing the elevators used in flour milling he went broadly into elevating and conveying mechanism. The field is an immense one, and the outlay involved in the preparation of such a work, with its abundant and generally excellent illustrations, might well have deterred editor and publisher. There are presented among the 550 illustrations not only many large photographic reproductions of the systems and devices described, but sectional and detail drawings, the whole, with the accompanying descriptions, making an exceptional contribution to engineering literature.

In arguing for the importance of his subject Mr. Zimmer presents figures showing an annual mineral production in the United Kingdom of 287,000,000 tons, and adds: "It is obvious that such quantities can only be economically handled by mechanical means." A vastly stronger presentation of the case could have been made by a citation of like figures for the United States. Moreover, the incentive to the largest use of handling machinery, as of all other machinery, in this country is increased by the high cost of hand labor as compared with hand labor for lifting and carrying materials in Europe. It was to be expected therefore that American systems and devices would figure to a larger extent in the work. Those of British or Continental origin are given much space, as is proper, and certain American lines are shown in a representative way. Yet some familiar systems that have done excellent work in this country do not appear, and important improvements made in the past year or two in others seem to have been overlooked. For example, a well-known system of coal handling and storage, represented in some of the largest and best equipped plants in the United States, is neither illustrated nor described.

Mr. Zimmer devotes the first section of his book to the continuous handling of material, the second to the intermittent handling of material, the third to unloading and loading appliances and the fourth to miscellaneous devices. His classification under "Continuous Handling of Material" is the following: 1. Appliances for lifting in a vertical direction or from one level to another—elevators. 2. Appliances for moving material in a horizontal direction—conveyors. 3. Appliances which both elevate material and convey it horizontally at the same

time. Conveyors the author divides into: (a) Those consisting of a fixed trough, in which the material is conveyed by means of a pushing agent; (b) appliances in which the trough containing the material moves bodily and with the material; (c) appliances in which the trough conveys the material by its own reciprocating motion.

In his chapter on elevators the author includes a description of the skip hoist employed at the more recently erected blast furnaces in the United States. Twelve chapters are devoted to descriptions of various forms of conveyors, including the worm, push plate, trough cable, band, traveling trough, vibrating trough, tilting bucket and pneumatic conveyors. In the chapter on conveyors for special purposes much space is given to coke conveyors and to casting machines for blast furnaces. Among coke handling plants are the Wellman-Seaver-Morgan, Marshall, Merz and Muller. The well-known casting machines in use in the United States are illustrated, and the Hawdon, which was brought out in Great Britain.

The second section of the work, that on intermittent handling of material, is illustrated with unusual profusion. Some excellent half-tones are given of noteworthy rope way and aerial cable way installation, including a large folded insert view of the cable way at the dock yards at Malta and the cable way erected for the purpose of constructing a viaduct over the Cannington Valley for the Axminster & Lyme Regis Light Railway. The special cable way for the coaling of vessels at sea forms an interesting section of this part of the work.

The section describing unloading and loading plants deals largely with the handling of coal, a minor share of attention being given to machinery for unloading ore. What the author designates as coal tips appear to be in very common use at Continental and British works, and there is a similarity in the various types shown. The well-known coal unloaders used in this country, both on the coast and at lake ports, commonly designated as car dumpers, are illustrated and described in some detail. In respect to ore unloading machinery, which has reached so marked a development at lower Lake Erie docks, the descriptions fail to bring out the more recent improvements in these devices which have resulted in the marvelous records of the last 12 months. One machine of American invention which is given considerable prominence in this connection never went beyond the patent office stage.

The fourth, or miscellaneous, section of the book contains six chapters, treating respectively of the automatic weighing of material, coaling of railway engines, coal handling appliances for gas works, power stations and boiler houses, floor and silo warehouses for grain and seed, coal stores and coal silos, and high level or cantilever cranes. The chapter on high level cranes describes some interesting appliances and gives prominence to bridges in use at blast furnaces in the United States for the stocking and rehandling of ore, but here also there are some omissions which are conspicuous.

But where so conspicuous a contribution has been made to engineering literature and a vast and important field has been covered so excellently it is perhaps not the thing to emphasize the few omissions. The work is highly creditable and will find a permanent place in engineering libraries, for Mr. Zimmer has certainly put the entire engineering world under obligation to him for so ambitious an undertaking.

Moody's Manual of Railroads and Corporation Securities.—Published by the Moody Corporation, 35 Nassau street, New York. Pages, 2580. Price, cloth, \$10; leather, \$12.

This work covers the entire field of corporation investments, comprising steam railroads, electric traction companies, gas and electric light companies, water supply companies, telephone and telegraph companies, mining and oil producing corporations, banks, trust companies, industrial corporations and companies of a miscellaneous character. In many of these lines this is the

only book of reference published, while in all of them the claim is made that it is the most accurate and complete. It is the only publication containing complete lists of the members of the stock exchanges in the various cities of this country. While it is of such a character as to be distinctively necessary in banking and brokerage houses it is of very great value to investors and business men generally.

NEWS OF THE WORKS.

Iron and Steel.

The York rolling mill of the Susquehanna Iron & Steel Company and the Blandon rolling mill, near Reading, are two Pennsylvania mills which have resumed after short periods of idleness.

Owing to the increasing demand for its iron lined brass and bronze tubes, the Phenix Tube Company, Brooklyn, N. Y., has completed arrangements for increasing its plant to double the present capacity. Building operations and installation of new machinery is now under way and the company expects to complete the improvements by July 1, so that it will be in a position to meet the demands of the fall season.

The Norwalk Steel & Iron Company, Norwalk, Ohio, is adding a 12-inch bar mill to its plant, and this mill is expected to be in operation next week. It is also putting in a new Torsell 40-ton furnace, which will increase the capacity of the plant 150 per cent. This furnace is expected to be in operation August 1. The mill produces soft center and soft surface steel plates and bars by a new process and has met with such success that its entire tonnage is contracted for up to July, 1906.

The Fort Worth Iron & Steel Mfg. Company, Fort Worth, Texas, is erecting a muck bar mill. The building is 60 x 200 feet in dimensions. It is expected to have this building in operation by July 15 or 20. The company manufactures iron bars, bolts, washers, nuts and other specialties.

At a meeting of the stockholders of the Driggs-Seabury Ordnance Corporation, at Sharon, Pa., held last week, it was decided to issue \$600,000 in preferred stock, increasing the capital to \$1,789,000. The additional capital will be used in making large additions to the plant, among which will be an erecting shop, 60 x 240 feet, in which caissons and limbers will be assembled for the United States Government.

The new rail mill which the Carnegie Steel Company, Pittsburgh, is erecting at its Edgar Thomson plant will be completed early in October and will roll light sections from 8 to 30 pounds. When this mill is completed there will be three rail mills at this plant, No. 1 rolling from 60 to 100 pound sections, No. 2 rolling from 25 to 70 pound sections, and the new mill, which will be known as No. 3. This mill will roll the lighter sections from both billet and rail seconds. It will consist of four stands of rolls, the first stand, where the rolling passes will be made, being three-high, while the other three stands will be two-high. There will be three roughing passes, two passes through the next two stands and one through the last stand, making eight in all. The steel building that will contain the mill will be 80 x 300 feet, and the monthly output will be from 10,000 to 12,000 tons.

The Latrobe Steel Company, Latrobe, Pa., is erecting a brick, steel and corrugated iron forge machine shop and power house. The McClintic-Marshall Construction Company has the contract for the buildings.

The W. DeWees Wood plant of the American Sheet & Tin Plate Company, at McKeesport, Pa., closed down this week for repairs.

The blast furnace of the Stewart Iron Company, Limited, at Sharon, Pa., is closed down. The furnace will be relined and extensively repaired.

The new blast furnace of the Wheeling Steel & Iron Company, at Martins Ferry, Ohio, has been completed and will be blown in as soon as a fuel supply is secured.

The Humbert tin plate plant of the American Sheet & Tin Plate Company, at Connellsville, Pa., has closed down.

General Machinery.

E. B. Rich & Son, Chicago, have incorporated for the manufacture of saw machinery and other machinery and tools. This firm has been in business for some years. It is at present located at 52 West Washington street.

The Sterling Blower & Pipe Mfg. Company, Hartford, Conn., has been incorporated under Connecticut laws with a capital stock of \$100,000. The officers are: President, A. C. Lynch; secretary and treasurer, G. W. Christoph; directors, these officers and J. Gilbert Calhoun and E. E. Winckler. The business has been conducted for 15 years as a copartnership.

The new shops of H. S. Kerbaugh, Incorporated, at Bellwood, Pa., have been put in operation. They are for repair of the contracting firm's appliances in use on railroad work between Harrisburg and Pittsburgh. There are five shops in the group, and dump cars will be made later on.

The Kennett Foundry & Machine Works, Kennett Square, Pa., has incorporated its business.

The entire plant of the Lewiston Machine Company at Lewiston, Maine, has been sold at auction to Edwin F. Scruton of that city for \$15,000.

The Bond Foundry & Machine Company has been organized to succeed to the business of Charles Bond, manufacturer of power transmitting machinery and supplies, at present at 518 Arch street, Philadelphia. It is proposed to move the Bond plant to Manheim, Pa., where the plant of the Greer-Clarkson Machine Shops, lately abandoned, has been purchased. The Greer-Clarkson property consists of a main shop, 60 x 140 feet; smith shop and boiler house, 20 x 27 feet, and a pattern shop, 37 x 40 feet, together with several smaller structures. It is thought that some additional machinery equipment will be needed for the new plant in addition to that already owned by the company. Charles Bond is president; Joseph Burr of Atlantic City, vice-president; Henry M. Beamsderfer of Manheim, treasurer, and H. H. Schenck, secretary. F. M. Shaw of Philadelphia and Philip F. Ruhl of Brickerville, Pa., are directors, together with the officers mentioned.

The Nordberg Mfg. Company, Milwaukee, Wis., manufacturer of mining machinery, has been awarded the contract for a new hoisting plant at the 5000-foot Mesnard shaft of the Quincy Mining Company at Houghton, Mich. The machinery is to be delivered next October.

The Vilter Mfg. Company, Milwaukee, Wis., manufacturer of Corliss engines and refrigerating and ice making machinery, has secured a contract through its New York office with the Japanese contracting and engineering firm of Takata & Co. for a complete ice making plant to be installed at Tokio, Japan. The plant will be of the ammonia compression system and will have a capacity of 50 tons of clear ice a day. The machinery will be shipped via the Pacific coast some time in July.

The Albany Forge Company, Albany, N. Y., is erecting a new shop for blacksmith work so as to give the company more room in the present shop for heavier forge work. All machinery for the improvements has been purchased, including a steam hammer. The company has lately added considerably to its machine shop equipment and has installed a new Higley saw and grinder, shaper and several lathes and by the middle of July or the first of August it expects to be fully equipped and running in all departments.

The Ohio Brass Company, Mansfield, Ohio, will start at once to erect buildings to replace those burned in the recent fire. The new buildings will include a brass foundry, 106 x 265 feet; machine shop, one story, 57 x 324 feet; machine shop, two stories, 57 x 292 feet, and a warehouse, 67 x 232 feet. The buildings will be either of fire proof or mill construction.

Power Plant Equipment.

The Du Mont Engineering Company, Des Moines, Iowa, was recently organized to erect ice and cold storage plants, central and city works and heating plants. The company is building a \$60,000 plant at Des Moines.

The Marshall Engine Company, Turners Falls, Mass., has been placed in the hands of a receiver by a New Jersey court, the action being taken to wind up the affairs of the company as a New Jersey corporation, preliminary to organizing a Massachusetts corporation. The company has been doing business for some time, manufacturing a steam engine. No shop has yet been established, the engines being built by outside parties under contract.

The Central Heat & Power Company, Rockford, Ill., has purchased one 360 horse-power boiler from the Heine Boiler Company. The company is endeavoring to secure the city lighting contract and if successful will add considerable other machinery.

The Nebraska State Penitentiary authorities have given an order for the engine for the prison electric system to the Harrisburg Foundry & Machine Works, Harrisburg, Pa.

James A. Miller & Brother, Chicago, sheet metal workers, are reconstructing the building at 135 Clinton street which was damaged by fire some time ago. It will be built seven stories high, 80 x 90 feet. A new engine and dynamo will be purchased, as will also new elevators. Other power equipment was not sufficiently damaged to prevent its reusing. The building will be leased to tenants requiring power.

The Black Belt Electric Railway & Power Company, Dallas, Texas, will issue bonds for the construction and equipment of about 200 miles of electric railroad, with power plants sufficiently equipped to operate it. The company holds franchises valued at \$100,000, rights of way and subscriptions to stock. The undertaking is divided into sections of from 5 to 20 miles. The company will require 70-pound rails and all kinds of material, machinery and labor. J. M. Carter is manager.

The Skinner Engine Company, Erie, Pa., will erect a new building of steel construction to be used as a testing and shipping room. It will adjoin an erection shop of similar construction and power house built last year.

The Danville Street Railway & Light Company, Danville, Ill., is installing a 26 x 52 x 48 inch cross compound Hamilton-Corliss engine and an 800-kw. 60-cycle three-phase generator in its

power plant. Another generator of 300 kw. capacity, furnished by the General Electric Company, will be installed within the next 60 days. The company is now having plans made for a new engine and boiler room for the Bloomington (Ill.) power house, but these are not far enough along as yet to give any definite information.

Foundries.

The Economical Stove Company, Jacksonville, Ill., has purchased a brass and iron foundry and will make improvements. It is too early to say what machinery will be needed.

The structural steel business of the Builders Iron Foundry, Providence, R. I., will hereafter be carried on by a new corporation known as the Providence Steel & Iron Company, in which the Builders Iron Foundry owns a controlling interest. The business will be under the same management as before.

The Stamford Foundry Company, Stamford, Conn., manufacturer of stoves, ranges and furnaces, is to make extensive additions to its plant to accommodate the growing demands of the Stamford Gas Stove Company, which is closely affiliated with the foundry company. The new buildings will consist of an addition 40 x 50 feet and four stories, an addition 40 x 48 feet and four stories and a four-story building 24 x 40 feet. Some new machinery will be installed, orders for a part of which have been placed.

A company with a capital of \$250,000 has been organized by Milwaukee, St. Paul and Duluth capitalists, to erect a 20-ton steel casting plant at the head of the lakes, employing from 150 to 200 men. Plans are being prepared by the Northwestern Engineering Company, Duluth, Minn., and the plant will be erected either in Duluth or Superior. Ground for the buildings will be broken within three months, with the expectation of commencing operations by the first of the year. The site has not yet been determined, and the names of the company and the promoters have not been made public.

The W. B. Taylor Company, recently incorporated with a capital stock of \$150,000, has succeeded Bingham & Taylor, iron founders.

Bridges and Buildings.

The Bedell Structural Steel & Foundry Company, New Orleans, La., the lowest bidder, has the contract for the construction of the Julia street steel shed No. 2, at New Orleans, awarded by the Board of Port Commissioners. The contract price was \$8,404.36. Other bidders and their bids were as follows: American Bridge Company, \$9,088.69; Schreiber & Sons, Limited, \$10,097.16; Bellefontaine Bridge Company, \$8,752.45; McClintic-Marshall Company, \$9,542.15; Champion Iron Works, \$9,726.54; Penn Bridge Company, \$9,468.40.

The Wisconsin Bridge & Iron Company, Milwaukee, Wis., has been awarded the contract for the construction of a bridge to span Portage Lake, between Hancock and Houghton, Mich. The bridge will be 284 feet, double deck draw span, with single railway track below and 20-foot roadway and two 6-foot sidewalks above. It will be turned by electric power, and the contract price, \$70,922, includes turning and operating machinery complete.

The Russell Wheel & Foundry Company, Detroit, Mich., has secured the contract for erecting the steel skeletons of two buildings to be erected at Detroit for the Seamless Steel Bath Tub Company of the United States of America.

The Pittsburgh Bridge & Iron Works, Pittsburgh, recently organized, is pushing work on the erection of its new plant at Rochester, Pa., and expects to place it in operation about August 1. The company purchased a site of 5 acres and is erecting a building of 90 x 200 feet. The plant will have an output of 750 tons a month of all kinds of structural steel for mill buildings, roof trusses, columns, girders, bridges, coal tipples and plate and tank work. Material will also be carried in stock. The officers are: George A. Klingelhofer, president; C. H. E. Succop, secretary and treasurer, and L. F. W. Hildner, engineer. The offices are located at 341 Sixth avenue, Pittsburgh.

The Amsler Engineering Company, engineer and contractor, Pittsburgh, has received a contract for the concrete foundation for the new depot of the Southern Railway Company, at Cincinnati, which will be 1200 feet long and 175 feet wide. This concern is also erecting the plant of the Crescent Forgings Company, at Hulton, Pa., consisting of four buildings, one 55 x 100 feet, a second 55 x 120 feet, a third 100 feet square and a fourth 60 x 75 feet. The concern recently completed the building of the plant of the Atlanta Rolling Mill & Tin Plate Company, at Atlanta, Ga., and is building some muffle and crucible furnaces for the new plant of the Pittsburgh Metallurgical Company, at Beaver Falls, Pa.

The Ritter-Conley Mfg. Company of Pittsburgh has received a contract for part of the structural steel used in the extension of the works of the Allis-Chalmers Company, at Milwaukee, Wis., calling for about 400 tons of steel.

Fires.

The rubber factory of M. Norton & Co., Medford, Mass., was destroyed by fire June 18, and with a loss of \$10,000.

The malleable iron works of William P. Brown, Racine, Wis., was nearly destroyed by fire about a week ago. The loss will exceed \$15,000.

The furniture factory of P. Derby & Co., on Canal street, New York, was destroyed by fire June 26.

Hardware.

F. E. Myers & Bro., manufacturers of pumps, haying tools, &c., Ashland, Ohio, have recently purchased land adjoining their present three-story machine shop, on which they plan to build an additional shop, 60 x 300 feet. They also have a 75 x 200 foot foundry addition in process of construction, this increased space being needed to take care of their growing trade.

Hubbard & Co., Pittsburgh, Pa., have recently made some extensive improvements in their shovel and tool manufacturing departments. Owing to increased business this firm found it necessary early in the year to begin running its plant double turn, which plan of operation it has since continued.

The American Wire Washer Company, Unionville, Conn., has recently moved from its former quarters in the old cardboard mill to the factory near the railroad station that was for some years occupied by the Dunham Nut Company, which moved away about two years ago. The Washer Company is now making a feature of its National lock washers, zinc and iron electrical washers, and also has several orders for special washers. It has added to its equipment and is at present having two more automatic machines built for its work.

The Fowler Nail Company, Seymour, Conn., manufacturer of horseshoe nails, is erecting an addition to its factory 26 x 68 feet, two stories, the purpose being to provide room for additional machinery for the manufacture of the Vulcan horseshoe nails. The extra machine equipment is now in the works.

The Atchison Saddlery Company, Atchison, Kan., which recently purchased a three-story and basement building, 45 x 150 feet, to be used as a harness factory, and is erecting a 20 x 80 foot collar factory, has concluded to operate both buildings by electric power, electric current to be furnished by the City Railway, Light & Power Company. A heating plant will be installed, as will also a sprinkling system.

Miscellaneous.

The Reynolds Patent Development Company has been organized to manufacture paper spools by a patent process, and it is proposed to move the business from Bridgeport, Conn., where it has been carried on in an experimental way, probably to Willimantic, Conn. George H. Reynolds, Mansfield, Conn., and E. S. Ross, Willimantic, are the prime movers in the enterprise.

The Lubron Mfg. Company, Incorporated, Boston, Mass., has been chartered in Massachusetts to manufacture lubricants, packing, valves, &c. The capital stock is \$25,000, and the officers are: President, W. E. Burke; treasurer, G. Dana Yeaton, and clerk, R. E. Macy, all of Boston. The office of the company is at 88 Broad street. The company has a factory sufficient for its present needs.

The American Malting Company, Chicago, whose plant is on 123d street, is making improvements which will involve about \$200,000. The old building is being completely reconstructed and an addition 58 x 98 feet built on. A new power house is also being installed, for which two generators have been purchased aggregating 240 horse-power, and 500 horse-power in water tube boilers. Modifications are being made in the plant to provide for electrical operation throughout. Charles A. Chapman, Chicago, mechanical and electrical engineer, has the work in charge.

Iron and Industrial Stocks.

NEW YORK, June 28, 1905.

The iron and steel stocks have been the leaders in activity and strength during the week. United States Steel common advanced from last Thursday to Tuesday from 29½ to 32¼ and the preferred from 97½ to 100. The so-called Southern group displayed corresponding strength. Tennessee Coal advanced from 81½ to 85, Sloss-Sheffield common from 79 to 83½, Republic common from 18½ to 30½ and Republic preferred from 75½ to 79. Colorado Fuel also showed strength, advancing from 43½ to 45½. Steel Foundries, however, moved in the opposite direction, declining from 42½ to 39½ in the same time. Can preferred also declined from 69½ to 67½. Last prices on active stocks up to 1.30 p.m. on Wednesday were as follows: Can common 11¼, preferred 68; Car & Foundry common 35¼, preferred 98½; Locomotive common 48½, preferred 113¼; Colorado Fuel 44½; Pressed Steel common 39, preferred 93¼; Railway Spring common 32½, preferred 96½; Republic common 19½, preferred 78; Sloss-Sheffield common 83½, preferred 105½; Steel Foundries common 10¼, preferred 39½; Tennessee Coal 84¼; United States Steel common 32¼, preferred 99¼, new 5's 94½.

The stockholders of the National Lead Company at a special meeting June 26 ratified the plan to increase the company's authorized capital stock from \$30,000,000 to \$50,000,000 by the issuance of \$10,000,000 additional preferred stock and the same amount of common stock.

Dividends.—Chicago Pneumatic Tool Company has declared a quarterly dividend of 1 per cent., payable July 20.

American Locomotive Company has declared the regular quarterly dividend of $1\frac{1}{4}$ per cent. on the preferred stock, payable July 21.

American Shipbuilding Company has declared the regular quarterly dividend of $1\frac{1}{4}$ per cent. on the preferred stock.

Vulcan Detinning Company has declared a quarterly dividend of $1\frac{1}{4}$ per cent. on the preferred stock, payable July 20.

The Pittsburgh Plate Glass Company of Pittsburgh has declared the usual quarterly dividend of $1\frac{1}{2}$ per cent., payable July 10.

The American Nut & Bolt Fastener Company of Pittsburgh has declared an extra dividend of $3\frac{1}{2}$ per cent., payable July 3.

The Ohio Fuel Supply Company has declared a quarterly dividend of $2\frac{1}{2}$ per cent., payable July 5.

The Manufacturers' Light & Heat Company of Pittsburgh, suppliers of natural gas, has declared the usual quarterly dividend of $1\frac{1}{2}$ per cent.

The Standard Coupler Company has declared the regular semiannual dividend of 4 per cent. on the preferred stock and a dividend of 1 per cent. on the common stock, payable June 30.

The National Fuel Gas Company, an identified interest of the Standard Oil Company, operating in western Pennsylvania and eastern Ohio, has declared the usual quarterly dividend of $1\frac{1}{2}$ per cent., payable July 1.

Union Switch & Signal Company has declared a quarterly dividend of 2 per cent. on the common stock and $2\frac{1}{2}$ per cent. on the preferred stock, both payable July 10.

Garvin Machine Company has declared the regular semiannual dividend of $3\frac{1}{2}$ per cent., payable July 1.

New York Air Brake Company has declared a quarterly dividend of 2 per cent., payable July 18.

Labor Notes.

The labor condition in New England continues to be most satisfactory. No strikes of any moment are recorded, the most serious being that of structural bridge workers employed on the bridge of the New York, New Haven & Hartford Railroad at Saugatuck, Conn., where the men were ordered out, according to the report, because of labor troubles at the plant of the company having the contract for the bridge. This is not an important matter excepting as it affects the work on the bridge. The temporary injunction of J. A. Colvin and others, Worcester, Mass., vs. the Iron Molders' Union has been dissolved, after having been in force since June 24, 1904, restraining the picketing of the premises of several Worcester foundries where the molders and coremakers went on strike, and also restraining the union from otherwise interfering with the foundries or their workmen. While the strike still exists in name the foundries affected are running smoothly with full forces of men on an entirely nonunion basis.

Upon the refusal of an increase of wages several hundred men employed as riveters, boiler makers and assistants have gone on a strike in the shops of the Erie Basin Dry Dock Company, Brooklyn, N. Y.

The Bridge and Structural Iron Workers' International Association has called out all the members of its organization employed by the Pennsylvania Steel Company on the Blackwell's Island Bridge. This association has also called out the men working on jobs of the steel company in Washington, New Haven, Havre de Grace, Maine and Kansas City. The refusal of the Pennsylvania Steel Company to recognize the union in its shops is said to be the cause of the strike.

A settlement has been reached between the Manufacturers' Association at Youngstown and the Molders' Union of that city, relating to wages to be paid in the foundries at Youngstown for the year commencing July 1. The agreement provides for a minimum rate of \$3 a day for molders and \$2.75 a day for core makers, these rates being a slight advance over previous wages. Outside of that the agreement of last year is unchanged and will be signed by the foundries of Youngstown and their employees.

OBITUARY.

P. F. PRATT.

Pascal Paoli Pratt, Buffalo, N. Y., long distinguished as a merchant, manufacturer and banker, died June 18, aged 85 years. He was born in Buffalo September 15, 1819, and his education was secured in the primitive schools of the day, supplemented by one year at Hamilton Academy, Madison, N. Y., and less than two years at Amherst College. At the age of 16 he began his business life as a clerk in the hardware store of his brother, Samuel F. Pratt. Three years later he was admitted to partnership in the firm of S. F. Pratt & Co., changed in 1846 to Pratt & Co. For many years thereafter the firm commanded a large business, reaching beyond the Mississippi. In 1857 he was instrumental in erecting at Black Rock, near Buffalo, a blast furnace and a rolling mill, which were operated until 1885, when the former was leased and the latter exchanged for manufacturing interests. The Fletcher Furnace Company, the Tonawanda Furnace Company and the Buffalo Iron & Nail Company were all founded through Mr. Pratt's instrumentality and all proved valuable acquisitions to the business life of the community. He retired from active business life in 1885, being then a member of the well-known firm of Pratt & Letchworth, now conducted by Josiah and Ogden P. Letchworth. As a banker Mr. Pratt's career was equally distinguished. When the Manufacturers' & Traders' Bank was opened in 1856 Mr. Pratt was elected its vice-president and he continued as such until 1885, when he was elected president. He also served as a director of the Bank of Buffalo, Third National Bank, Bank of Attica and railroad and gas companies. His benefactions were large, especially to institutions looking to the uplifting of humanity. He is survived by three sons and four daughters.

NOTES.

GEORGE E. MACKLIN, general manager of the Pressed Steel Car Company, Pittsburgh, Pa., died in St. Joseph's Hospital, Philadelphia, June 26, of tuberculosis. He was born in McVeyton, near Harrisburg, 42 years ago. In early life he showed a decided taste for higher education and engineering problems. After graduating from the Rensselaer Polytechnic Institute his first notable employment was with the Colorado Fuel & Iron Company, and after considerable service he left there to accept a position with the Simplex Railway Appliance Company. He was with this company several years and left it in 1899 to engage with the Pressed Steel Car Company. He was connected with the sales department and made such a good record that he was promoted and transferred to take charge of the New York office, with the title of assistant general sales agent. In this capacity his ability and success were so pronounced that he was returned to Pittsburgh as acting general manager and later was elected general manager and a member of the Board of Directors. He was also general manager of the Pennsylvania Car Wheel Company.

COL. CHARLES ALEXANDER JEWELL, treasurer of the Jewell Belting Company, Hartford, Conn., died June 25, aged 64 years. He was the youngest son of Pliny Jewell, founder of the business, and was born in Winchester, N. H., March 29, 1841. After graduating at the Hartford High School he entered the employ of Pliny Jewell & Sons, as the firm was styled, first as a clerk and later as an apprentice, and afterward became a partner of his brothers. He served in the Civil War in the Twenty-second Connecticut Volunteers and was its adjutant. In 1883, when the Jewell Belting Company was incorporated, Colonel Jewell was made its treasurer, which office he held until his death. He was also treasurer of the Jewell Pin Company, and was affiliated with other enterprises bearing the Jewell name. He filled various other offices of financial and business trust. He was for years president of the Hartford Young Men's Christian Association, was active in the G. A. R. and other veteran associations, and was a Knight Templar. He leaves a widow.

The Iron and Metal Trades

Very little has occurred during the past week calculated to throw light upon the tendencies which are shaping the markets. Those who watch the water rushing into the mill are satisfied; others who study the reports of rainfall over the watershed are more doubtful. It certainly has not rained orders very hard for some time past, and while the great majority take that fact philosophically, a few are becoming a little uneasy.

In Foundry Pig Iron the markets have weakened further and \$11.25 for No. 2 at Birmingham has been done on a modest scale. The buying movement has not yet set in. How much longer it can be postponed is the question. Many consumers are pretty well covered well into the third quarter, the furnaces being correspondingly booked. Still Pig Iron is accumulating at the furnace banks, and the demand for Pig Iron for Steel making purposes, in particular, in the Central West, is light. The statement is emphatically made by the highest authority that the leading interest needs no outside Iron for July, reports from other sources to the contrary notwithstanding.

The conditions in Raw Material are not readily reflected in the finished branches, with their "official" prices. The big mills in the heavy lines are busy for months to come, and in some instances are crowded beyond capacity, so that they must dole out the product with the aim to placate the maximum number of irate customers. But that is not true in all branches or in all parts of the country.

There are prospects of additional work from the Lake shipbuilding yards. The railroads are still buying and large building operations in nearly all our great cities are flourishing.

The independent manufacturers of Sheets and of Bars have declined to sign the scale presented by the Amalgamated Association and it looks as though we were heading for a strike, with the odds heavily against the men.

Reports are current that several of the prominent mills are extending and renewing certain of the low priced contracts on Sheets and Bars made some time since.

There are no particularly interesting developments in the export trade, which is being pushed vigorously and which promises to be larger than ever before.

As we go to press we learn that the Pittsburgh Steel Company has closed a contract with the United States Steel Corporation for 1,000,000 tons of Bessemer and Open Hearth Steel Billets, to be delivered at the rate of about 200,000 tons a year.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

June 28, June 21, May 31, June 29,
1905. 1905. 1905. 1904.

PIG IRON:

Foundry Pig No. 2, Standard, Philadelphia	\$16.50	\$16.50	\$17.00	\$14.50
Foundry Pig No. 2, Southern, Cincinnati	14.00	14.50	15.25	11.75
Foundry Pig No. 2, Local, Chicago	16.25	16.25	17.25	13.25
Bessemer Pig, Pittsburgh	15.35	15.35	15.85	12.50
Gray Forge, Pittsburgh	14.85	14.85	15.50	12.10
Lake Superior Charcoal, Chicago	16.50	16.50	17.50	14.50

BILLETS, RAILS, &c.:

Steel Billets, Pittsburgh	21.00	21.00	23.00	23.00
Steel Forging Billets, Pittsburgh	25.00	25.00	26.00	....
Steel Billets, Philadelphia	26.00	26.00	26.50	....
Steel Billets, Chicago	27.00	28.00	28.00	24.00
Wire Rods, Pittsburgh	32.50	33.00	34.00	28.50
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

OLD MATERIAL:

O. Steel Rails, Chicago	13.00	12.00	13.00	9.50
O. Steel Rails, Philadelphia	15.25	15.00	15.75	11.00
O. Iron Rails, Chicago	17.25	17.00	18.00	14.50
O. Iron Rails, Philadelphia	18.00	18.00	20.00	14.50
O. Car Wheels, Chicago	14.25	14.25	14.25	10.50
O. Car Wheels, Philadelphia	14.50	14.50	15.50	11.00
Heavy Steel Scrap, Pittsburgh	13.50	13.50	14.25	11.00
Heavy Steel Scrap, Chicago	12.25	11.75	12.00	9.00

FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia	1.63½	1.63½	1.63½	1.48½
Common Iron Bars, Chicago	1.50	1.50	1.50	1.30
Common Iron Bars, Pittsburgh	1.55	1.55	1.50	1.30
Steel Bars, Tidewater	1.54½	1.64½	1.64½	1.49½
Steel Bars, Pittsburgh	1.40	1.40	1.50	1.35
Tank Plates, Tidewater	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater	1.74½	1.74½	1.74½	1.74½
Beams, Pittsburgh	1.60	1.60	1.60	1.60
Angles, Tidewater	1.74½	1.74½	1.74½	1.74½
Angles, Pittsburgh	1.60	1.60	1.60	1.60
Skelp, Grooved Steel, Pittsburgh	1.50	1.50	1.50	1.35
Skelp, Sheared Steel, Pittsburgh	1.55	1.55	1.55	1.35
Sheets, No. 27, Pittsburgh	2.20	2.20	2.20	2.00
Barb Wire, f.o.b. Pittsburgh	2.25	2.25	2.25	2.50
Wire Nails, f.o.b. Pittsburgh	1.80	1.80	1.80	1.90
Cut Nails, Mill	1.80	1.80	1.80	1.75

METALS:

Copper, New York	15.00	15.00	15.00	12.62½
Spelter, St. Louis	5.07½	5.07½	5.10	4.70
Lead, New York	4.55	4.50	4.50	4.20
Lead, St. Louis	4.47½	4.42½	4.40	4.12½
Tin, New York	30.70	30.55	30.05	25.50
Antimony, Hallett, New York	11.50	11.50	9.25	7.25
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer .....	.....	.....	.....	.....
100 pounds, New York	3.74	3.74	3.74	3.64

Chicago.

FISHER BUILDING, June 28, 1905.

Iron and Steel markets present a somewhat confusing array of strong and weak elements, but the undertone of it all is so strong that weak spots are very generally looked upon as only temporary and the results of special conditions. July inventories are playing rather a larger part than usual in the excuses made by buyers for delaying purchases. In some cases the inventory plea is known to be imaginary, but as a general thing the half year just closing has been such a good one that works managers are holding down their purchases to the minimum in order to make gratifying reports to their directors. This applies to railroads and large buyers in every branch of industry. Southern Pig Iron is a good 50c lower than last week for prompt delivery, say to the end of August, but there are a number of important Southern interests that are content to stay out of the market for any price below \$12 basis, even for nearby delivery, and that will not accept \$12 for second half contracts. Northern Iron is unchanged for contract tonnages, though some Northern furnaces have Iron which they will sell to their own customers on a basis nearly as low as the delivered price of Southern Iron. The buying movement in Iron is more active than it was last week. In Finished Iron and Steel products the mills are rather more complacent in extending or renewing low priced contracts than was expected. This is particularly true of Sheets and Bars. The recent lowering of quotations in the Pittsburgh markets on Billets and Sheet Bars is thought to be a factor in this change of attitude. A new strength in Old Materials is taken to be a forerunner of better days to come speedily, particularly as the largest dealers are the highest bidders as a rule.

Pig Iron.—So many considerations enter into the market on Pig Iron at the present time that it is difficult to

quote actual market prices. Producers almost without exception look for a very speedy upward turn of the market and are for that reason unwilling to obligate themselves very far at prices which they would be glad to accept for prompt shipment. Southern Iron has receded 50c. since last week's quotation, and we quote it below on the basis of \$11.50 at the furnace. We do not change the quotations on Northern Irons, although there are instances where Northern producers deem it to their advantage to make a price that will very nearly meet the delivered figure of Southern Iron. This, however, is said to be the exception rather than the rule. Silvery Irons, which for a long time refused to share in the decline of other Southern products, have now fallen to a point where they are at their usual parity with Foundry grades. There is a very large tonnage of Iron yet to be bought for second half delivery, and stocks in melters' yards are running low. Of importance in considering the trend of affairs are the new strength shown in Scrap Iron and the fact that dealers are buying liberally. The following prices represent about the going figures for July, August and September delivery. Second half contracts, particularly on Southern Iron, would be quoted by most producers at higher figures. We quote the following prices:

Lake Superior Charcoal.....	\$16.50 to \$17.00
Northern Coke Foundry, No. 1.....	16.75 to 17.00
Northern Coke Foundry, No. 2.....	16.25 to 16.50
Northern Coke Foundry, No. 3.....	15.75 to 16.00
Northern Scotch, No. 1.....	17.00 to 17.50
Ohio Strong Softeners, No. 1.....	17.30
Ohio Strong Softeners, No. 2.....	16.80
Southern Silvery, 4 to 6 per cent. Silicon.....	16.65 to 17.65
Southern Coke, No. 1.....	15.65
Southern Coke, No. 2.....	15.15
Southern Coke, No. 3.....	14.65
Southern Coke, No. 4.....	14.40
Southern Coke, No. 1 Soft.....	15.65
Southern Coke, No. 2 Soft.....	15.15
Southern Gray Forge.....	14.15
Southern, Mottled and White.....	13.90
Malleable Bessemer.....	16.25 to 16.50
Standard Bessemer.....	16.80 to 17.05
Jackson Co. and Ky. Silvery, 6 % Silicon.....	19.05 to 19.30
Jackson Co. and Ky. Silvery, 7 % Silicon.....	19.55 to 20.05
Jackson Co. and Ky. Silvery, 8 % Silicon.....	20.05 to 20.30
Jackson Co. and Ky. Silvery, 10 % Silicon.....	21.05 to 21.30
Alabama Basic.....	15.90 to 16.15

Old Material.—A very decided improvement in tone on Old Materials is noticeable on every hand, and bids submitted to the Burlington and the St. Paul roads were from 50c. to \$1 higher than our quotations of a week ago. Dealers as a rule are higher bidders than consumers, indicating the faith that dealers have in the future of this material. The following prices represent the figures which large buyers would pay for considerable tonnages:

Old Iron Rails.....	\$17.25 to \$17.50
Old Steel Rails, 4 feet and over.....	13.00 to 13.50
Old Steel Rails, less than 4 feet.....	12.50 to 13.00
Heavy Relaying Rails, subject to inspection.....	22.25 to 22.75
Heavy Relaying Rails, for side tracks.....	19.50 to 20.00
Old Car Wheels.....	14.25 to 14.75
Heavy Melting Steel Scrap.....	12.25 to 12.50
Frogs, Switches and Guards.....	12.50 to 13.00
Mixed Steel.....	10.00 to 10.50

The following quotations are per net ton:

Iron Fish Plates.....	\$15.50 to \$16.00
Iron Car Axles.....	20.00 to 20.50
Steel Car Axles.....	15.50 to 16.00
No. 1 Railroad Wrought.....	13.50 to 14.00
No. 2 Railroad Wrought.....	12.50 to 13.00
Shafting.....	15.00 to 15.50
No. 1 Dealers' Forge.....	10.00 to 10.50
Wrought Pipes and Flues.....	10.00 to 10.50
No. 1 Cut Busheling.....	9.50 to 10.00
Iron Axle Turnings.....	9.75 to 10.00
Soft Steel Axle Turnings.....	9.50 to 10.00
Machine Shop Turnings.....	9.50 to 10.00
Cast Borings.....	8.00 to 8.50
Mixed Borings, &c.....	8.00 to 8.25
No. 1 Mill.....	8.75 to 9.25
Country Sheet.....	7.00 to 7.50
No. 1 Boilers, cut to Sheets and Rings.....	9.50 to 10.00
No. 1 Cast Scrap.....	12.50 to 13.00
Stove Plate and Light Cast Scrap.....	9.00 to 9.50
Railroad Malleable.....	12.00 to 12.25
Agricultural Malleable.....	11.50 to 12.00

Coke.—Connellsville 72-hour Foundry Coke is unchanged at from \$2.25 to \$2.50 at the ovens, or \$4.90 to \$5.15, Chicago. Connellsville Furnace Coke and Foundry Cokes from less favored districts range from 25c. to 50c. lower than these prices.

(By Mail.)

Billets.—Reports from Pittsburgh that the Billet market there had weakened to a point where \$22 was easily done on either Bessemer or Open Hearth Billets have apparently not yet affected the local market here, because Forging Billets are still salable at from \$28 to \$30. Twenty-two dollars Pittsburgh would mean \$25 Chicago.

Rails and Track Supplies.—Inquiry is good for this time of year and some small orders of Standard Sections for electric roads have been placed with the Western sales office of the Carnegie Steel Company. One of these lots aggregated about 2500 tons. Prices are unchanged, as follows: Standard Section Rails, \$28 per gross ton at maker's mill in 500-ton lots or greater, plus full freight to destination; Light Section Rails, \$24 to \$27 per gross ton, accord-

ing to weight and tonnage; Angle Bars, 1.40c. to 1.50c.; Spikes, 1.75c. to 1.85c., f.o.b. mill, in car lots; Track Bolts, 2.40c. to 2.50c., base, Square Nuts. Store prices on Track Supplies range from 15c. to 25c. per 100 lbs. above car lot mill prices.

Structural Material.—Wells Brothers, Chicago, were awarded the general contract for erecting the addition to the Commonwealth Electric Company's plant, which will use about 1500 tons of Structural Steel. This Steel will doubtless be placed with the American Bridge Company. Aside from this no deals of any importance have come to the surface. The announcement that the Eastern Steel Company's new mill at Pottsville will soon be ready to ship Structural Steel into this market is hailed with satisfaction by buyers, as it may relieve the situation somewhat. Demand for Structural Sections seems to be increasing rather than decreasing, and by the time the Illinois Steel Company's new mill is ready for operation the coming winter there is little doubt that it will have a full rolling list, as there is no likelihood of the mills catching up before next spring. Official prices for delivery from mill, f.o.b. Chicago, in car lots, are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.76 $\frac{1}{2}$ c.; Angles, 3 to 6 inches, $\frac{1}{4}$ -inch and heavier, 1.76 $\frac{1}{2}$ c.; Angles, larger than 6 inches on one or both legs, 1.86 $\frac{1}{2}$ c.; Beams, larger than 15 inches, 1.86 $\frac{1}{2}$ c.; Tees, 3 inches and over, 1.76 $\frac{1}{2}$ c.; Tees, 3 inches and over, 1.81 $\frac{1}{2}$ c., in addition to the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. Store prices on Angles, Beams and Channels range from 2.10c. to 2.50c., according to quantity on hand in store or obtainable from mill.

Plates.—The Plate market is a shade easier in that there is less difficulty in getting prompt shipment from mills. At the same time the mill situation is such that the large jobbing firms are doing a heavy business, getting many orders for shipment from store that would ordinarily go to the mills. There is a disposition on the part of some mills to extend old low priced contracts expiring July 1 some months later. Prices are unchanged and firm, as follows: Tank quality, $\frac{1}{4}$ -inch and heavier, wider than 14 and up to 100 inches wide, inclusive, car lots, Chicago, 1.76 $\frac{1}{2}$ c.; 3-16 inch, 1.86 $\frac{1}{2}$ c.; Nos. 7 and 8 gauge, 1.91 $\frac{1}{2}$ c.; No. 9, 2.01 $\frac{1}{2}$ c.; Sheared and Universal Mill Plates, Tank quality, 6 $\frac{1}{4}$ to 14 inches, inclusive, 10c. below these prices; Flange quality in widths up to 100 inches, 1.86 $\frac{1}{2}$ c., base, for $\frac{1}{4}$ -inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86 $\frac{1}{2}$ c.; Flange quality, 1.96 $\frac{1}{2}$ c. Store prices on Plates are as follows: Tank Plate, $\frac{1}{4}$ -inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.15c. to 2.25c.; Flange quality, 25c. extra.

Sheets.—It appears that the proposed consolidation of independent Sheet Steel mills has been abandoned for the present by the Pittsburgh interests that were back of that move, owing to the exorbitant prices asked by their plants for the mills themselves. The threatened tie-up of mills depending upon Amalgamated help is giving a somewhat stronger tone to the market, as there is a likelihood that production will be considerably curtailed during the mid-summer on this account. As a general proposition it is thought that such a tie-up would benefit rather than injure the Sheet trade as a whole, as it would lead to the absorption of surplus stocks, which have been demoralizing the market for such a long time. Prices on car lots and larger, f.o.b. Chicago, average about as follows: Blue Annealed, Nos. 9 and 10, 1.86 $\frac{1}{2}$ c.; Box Annealed, Nos. 18 and 20, 2.16 $\frac{1}{2}$ c.; No. 27, 2.36 $\frac{1}{2}$ c.; No. 28, 2.41 $\frac{1}{2}$ c., with the customary differentials between gauges. Store prices are based on a minimum of 2.10c. for No. 10 Blue Annealed, 2.50c. for Nos. 18 and 20 Box Annealed, 2.65c. for No. 27 Box Annealed and 2.75c. for No. 28 Box Annealed. Galvanized Sheets are quoted in car lots from mill at about the following prices, some mills asking a little more and some offering at \$1 a ton less: No. 10, 2.46 $\frac{1}{2}$ c.; Nos. 17 to 21, 2.81 $\frac{1}{2}$ c.; No. 27, 3.36 $\frac{1}{2}$ c.; No. 28, 3.56 $\frac{1}{2}$ c. Store prices on Galvanized Sheets are as follows: Nos. 10, 12 and 14 are selling at from 3c. to 3.10c., Nos. 22 and 24 at from 3.05c. to 3.15c., No. 27 at from 3.50c. to 3.65c. and No. 28 at from 3.70c. to 3.95c., with intermediate gauges in proportion and with customary differentials for widths and lengths.

Bar Iron.—The policy of extending old 1.30c. and 1.40c. contracts, which would otherwise expire by limitation July 1, seems to be adopted quite generally, and, as a matter of fact, there is a very small percentage of Steel going into consumption that was bought at higher than 1.30c., Pittsburgh. As long as the large producers of Steel Bars maintain the policy of extending and renewing old contracts at the 1.30c. basis there will not be a very large tonnage of Iron Bars consumed at the present basis of 1.55c., Chicago. Conditions are unchanged since last week, with Bar Iron quite firm at 1.55c., base, half extras, Chicago, in car lots; Bar Steel, officially 1.66 $\frac{1}{2}$ c., Chicago, but actually 5c. to 10c. lower from some quarters; Hoops, 1.81 $\frac{1}{2}$ c. rates, full extras. Soft Steel Angles and Shapes, 1.76 $\frac{1}{2}$ c., half extras,

and Hard Steel Angles and Bars at about 10c. below the price of Soft Steel. In store prices Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras; Steel Angles and Shapes, 1.95c., half extras, and Soft Steel Hoops, 2.20c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

Merchant Steel.—The contracting movement, which had a fairly active start a week or two ago, has suffered a temporary setback by the weakness of Pig Iron, which is taken by buyers generally as an index of the whole Iron and Steel situation. When Pig Iron advances, as it is sure to do soon, a general contracting movement for Finished Steel Shapes is expected. Current prices are as follows: Smooth Finished Machinery Steel, 1.91½c.; Smooth Finished Tire, 1.86½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Cal: Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special Grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount in car lots and 45 per cent. in less than car lots in base territory.

Merchant Pipe.—Notwithstanding the wet spring consumption of Pipe has been large, particularly the sizes that go into building operations. Jobbers' stocks seem to be running low, and there is a strong undertone in the market based on the general prosperity of the country and the prospect of another good crop. Official discounts named by the leading producer for car lots to consumers are as follows: Black Steel, 73.35; Galvanized Steel, 63.35; Black Iron, 71.85; Galvanized Iron, 61.85, with the customary differentials for larger and smaller diameters and for X and XX strong. Meanwhile the independent mills are adhering quite firmly to the November, 1904, schedule, which rules \$4 a ton lower than the figures just named.

Boiler Tubes.—While the leading producer is a number of weeks behind its orders, there are independent mills that are making prompt delivery on both Iron and Steel Lapweld Tubes. Discounts to consumers are unchanged, as follows, in car lot shipments from mill at Chicago: Base sizes, 2½ to 5 inches, Steel Tubes, 60.35; Iron, 49.35; Seamless Steel, 50.85; while jobbers' discounts are officially two points higher, or about \$4 a ton lower in price. Larger and smaller diameters take the usual extras in price, and less than car lots are quoted at two points less discount. We quote from store:

	Steel.	Iron.	Seamless.
1 to 1½ inches.....	40	35	42½
1½ to 2¼ inches.....	50	35	35
2½ inches.....	52½	35	30
2½ to 5 inches.....	60	47½	42½
6 inches and larger.....	50	35	..

Cast Iron Pipe.—Owing to the lower cost of Pig Iron makers of Cast Iron Pipe have changed their schedule by lowering prices on the large sizes. Present quotations on small lots, car lots and greater, f.o.b. Chicago, are: Water Pipe, 4-inch, \$29; 6, 8 and 10 inch, \$28; 12-inch and larger, \$27.50, per net ton, with \$1 extra charged for Gas Pipe. Orders were taken by the leading producer recently for the following lots: Manistique, Mich., 800 tons; Liberty, Mo., 800 tons; Moline, Ill., 350 tons; La Harpe, Kan., 300 tons.

Metals.—Business is very quiet and prices are unchanged. We quote Pig Tin 31½c. to 32c. in car lots and 32c. to 32½c. in small lots. Spelter, 5¼c. for car lots and 5½c. to 5¾c. for small lots. Casting Copper is 14½c. to 15c.; Lake, 15c. to 15½c. in car lots, with ¼c. to ½c. higher for small lots. Lead is quoted in 50-ton lots at 4.55c., in car lots at 4.60c., and 5c. to 5.25c. in small lots. The new Sheet Zinc schedule is based on \$7, La Salle, for car lots of 600-lb. casks; car lots, Chicago, are sold on the basis of \$6.75, with small lots selling at from \$7 to \$7.50 per 100 lbs. Prices of Old Copper and Brass are as follows: Copper Wire, 13½c.; Heavy, 13c.; Copper Bottoms, 12c.; Copper Clips, 12¾c.; Red Brass, 11¾c.; Red Brass Borings, 9¾c.; Yellow Brass, Heavy, 8¼c.; Yellow Brass Borings, 7¾c.; Light Brass, 7c.; Lead Pipe, 4¼c.; Tea Lead, 3.85c.; Zinc, 4c.; Pewter, No. 1, 19¼c.; Block Tin Pipe, 25c.

The Spring Valley Iron & Ore Company, whose blast furnace is at Spring Valley, Wis., announces to the trade that beginning July 1 Pickands, Brown & Co., Chicago, will be its exclusive selling agents for Pig Iron. Pickands, Brown & Co. had been sales agents for a number of years prior to a comparatively recent change to Matthew Addy & Co.

All the offices of the Chicago & Northwestern Railway have been moved from their old home at 22 Fifth avenue, Chicago, to the new Northwestern Building, Jackson and Franklin streets.

A. M. Castle & Co., Chicago, have been appointed exclusive Western sales agents for the Eastern Steel Company, whose new plant at Pottsville, Pa., is nearing completion. This firm has found it necessary to lease the entire building at 55 to 59 North Jefferson street, seven stories and basement, to accommodate the rapid growth of its business. This gives the firm about 65,000 square feet of floor space.

Philadelphia.

FORREST BUILDING, June 27, 1905.

While there has been no great activity either in Iron or Steel, nor is anything of that kind expected until after the midsummer holidays, yet there is an appreciable change in sentiment all around. There are some articles that buyers would be glad to get at last week's prices, while in others sellers show less disposition to accept business at the extreme low prices which were accepted during the past two or three weeks. Nevertheless the market is by no means fully settled. It looks as though it might be so in the near future, but in the meanwhile there is great irregularity, especially in the prices of Pig Iron. To report some of the transactions just as they occurred would be misleading as regards the general market, but ordinarily there is very little change. Small and medium sized lots of No. 2 X Foundry command anywhere from \$16.50 to \$17, delivered, but when it comes to 500 or 1000 ton lots and upward \$16 and even less than that are not uncommon figures. A considerable business of this kind is now on the market and the figures at which material is offered for heavy tonnages is in marked contrast with general quotations. This, however, appears to be the usual routine before the market can be lifted out of a rut. The large buyers must come in first, then the odds and ends must be cleaned up, after which the way is clear for uniform prices to the regular trade. It looks as though the preliminary stages have commenced and that it will not be very long before normal conditions are re-established. A curtailment in the output of Pig Iron must be shown in the next monthly report to give the right tone to the market, and if the reduction should be of a pronounced character, the effect upon prices ought to be very stimulating. Meanwhile the general tone of the market is better than could have been expected, considering the season. Prices are steady, inquiries are increasing and the general outlook indicates that a vigorous buying movement will be met with during the coming month.

Pig Iron.—It is extremely difficult to define the exact situation as regards Pig Iron. All sorts of ideas are met with in the trade, and even men of great experience hold widely divergent views. Some think that prices will have to go considerably lower before they touch absolutely rock bottom. Others think that around \$16, delivered, for No. 2 X Foundry there is no possibility of further recessions, inasmuch as such prices would not return a new dollar for an old one, consequently the supply would decrease automatically. It takes time to adjust the supply and demand so as to secure remunerative prices, but it may be regarded as certain that owners will not run their furnaces at a loss, neither will they pile up Iron on the chance of a better market later on. That was the practice years ago, but does not prevail to any great extent now, although there are at the present time two conspicuous instances of that kind, and these companies are held partly responsible for the recent deadlock in the market. Consumers find out who are piling Iron, and as the stock increases they lower their bids until in the long run they find themselves at a bargain counter. The excess tonnage is not large enough to be a serious menace, but it has to find a market before the atmosphere of prices is fully cleared. This may occur within 30 or 60 days, or, if the holders refuse to unload, it will almost surely prevent that quick recovery which might otherwise be expected. As we said before, \$16.50 to \$17 is the range of prices for No. 2 X Foundry to the ordinary trader. Lots of 500 to 2000 or 3000 tons each have to go at less money, depending upon deliveries, analysis, &c. In some cases (not in this immediate district, however) equivalent to less than \$16 has been quoted, and some of the large buyers intimate that they are not particularly anxious to place orders even at the figure named. There is a disposition to see a little further ahead before taking any decided position, although it may involve the risk of paying more if conditions begin to show improvement. Mill Irons are very dull, and are hardly salable unless at very low prices, and even then they are not needed for immediate use. Steel making Irons are totally neglected, so that prices for such are purely nominal. Quotations are very irregular, but for Philadelphia and nearby deliveries the range would be about as follows:

No. 1 X Foundry.....	\$17.25 to \$17.50
No. 2 X Foundry.....	16.50 to 17.00
No. 2 Plain.....	15.75 to 16.00
No. 3 Foundry.....	15.00 to 15.25
Standard Gray Forge.....	14.75 to 15.25
Basic, nominal.....	16.00
Low Phosphorus.....	20.25 to 20.75
Southern No. 2 X Rail.....	16.00 to 16.25
Southern No. 2 X Rail, on dock.....	15.50

Ferromanganese.—There is no demand; prices nominal at about \$47 to \$47.50, ex-ship.

Muck Bars.—There is no demand at the present time, so that it is hard to quote prices, which, however, would probably be \$27.50 to \$28.50, seller's mill.

Steel.—There is a good demand and prices are steady

at \$26 for Open Hearth Billets in good sized lots, and a little more for smaller quantities.

Plates.—There is little that can be said in regard to the Plate trade, except that the demand is maintained and that prospects are very good. Orders during the past week have not been of a specially notable character, but they have been sufficient to offset the shipments, so that manufacturers are fully holding their own. Prices remain as last quoted—viz.:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel, over 14 inches wide.....	1.73½	1.78½
Tank, Bridge and Boat Steel, rectangular Plates, 14 inches wide and under.....	1.63½	1.68½
Flange or Boiler Steel.....	1.83½	1.88½
Marine, A. B. M. A. and Commercial Fire Box Steel.....	1.93½	1.98½
Still Bottom Steel.....	2.03½	2.08½
Locomotive Fire Box Steel.....	2.23½	2.28½
The above are base prices for ¼-inch and heavier. The following extras apply:		
3-16 inch thick.....	\$0.10	pounds extra.
Nos. 7 and 8, B. W. G.....	.15	"
No. 9, B. W. G.....	.25	"
Plates over 100 to 110 inches.....	.05	"
Plates over 110 to 115 inches.....	.10	"
Plates over 115 to 120 inches.....	.15	"
Plates over 120 to 125 inches.....	.25	"
Plates over 125 to 130 inches.....	.50	"
Plates over 130 inches.....	1.00	"

Structural Material.—Business in this department is very good, almost everything running full, and for some sections mills are very far behind with their orders. An immense tonnage will have to be run out during the remainder of the year, and there is little doubt that it will exceed all records for any similar period. Prices are as follows: Beams, Channels and Angles, 1.73½c. to 1.85c., according to specifications, and small Angles, 1.65c. to 1.68c.

Bars.—The Bar trade is not particularly active, but there is a pretty good undertone to prices, although reports of "cutting" are not infrequent. Careful inquiry was made in regard to this matter, however, and at the meeting of the Eastern Bar Iron Association held in New York last week, it was the opinion that prices had been maintained, and that reports to the contrary were not well founded. The demand is fair for the season, and it is expected that when the mills resume work after the holidays considerable work will come out. Meanwhile prices of Refined Iron, or Soft Steel Bars, are steady at 1.63½c. for carload lots as a minimum quantity.

Sheets.—The demand holds up very well, and everything is running full at the present time. Ten days' or two weeks' suspension of work which will be made during the holidays, will probably cause a good demand later on. Prices unchanged, as follows: 18 to 20 gauge, 2.30c.; 22 to 24 gauge, 2.40c.; 25 and 26 gauge, 2.50c.; 27 gauge, 2.60c., and 28 gauge, 2.70.

Old Material.—There is a better feeling in Scrap Material and Steel is decidedly firmer. Some holders ask \$15.25 to \$15.50 for Heavy Melting Steel, but purchases during the week were mostly at about \$14.50, although it is doubtful if better than \$15 could be done to-day. Other descriptions are irregularly better, but there is no settled market yet. Bids and offers for lots delivered buyers' yards are about as follows:

Scrap Rails.....	\$15.25 to \$15.50
No. 1 Steel Scrap.....	14.75 to 15.25
Old Steel Axles.....	16.50 to 17.50
Old Iron Axles.....	21.00 to 22.00
Old Iron Rails.....	18.00 to 19.00
Old Car Wheels.....	14.50 to 15.00
Choice Scrap, R. R. No. 1 Wrought.....	15.50 to 16.00
No. 1 Yard Scrap.....	14.00 to 15.00
Long and Short.....	13.00 to 14.00
Machinery Scrap.....	4.00 to 14.50
Wrought Iron Pipe.....	11.50 to 12.00
No. 1 Forge Fire Scrap.....	12.00 to 12.50
No. 2 Light Ordinary.....	10.00 to 11.00
Wrought Turnings.....	10.00 to 11.00
Axle Turnings, Choice Heavy.....	12.50 to 13.00
Cast Borings.....	7.50 to 8.00
Stove Plates.....	9.00 to 10.00

Cincinnati.

FIFTH AND MAIN STS., June 28, 1905.—(By Telegraph.)

Pig Iron.—Buyers as a whole are still keeping aloof and it seems well nigh impossible to get them at all interested and tuned up to the pitch where they will enter the market in any other manner than for the mere supply of their daily needs. They are apparently convinced that the downward tendency has not been checked and by holding off for a short time longer they may be able to procure a supply for the last half at a figure below present quotations. We are told that there has been quite a little flurry of inquiries in a small way, but no substantial trade has resulted. It seems almost impossible that present conditions shall continue for any length of time, as it is a well-known fact that a large majority of melters of both large and small tonnage will necessarily be compelled to add to their stock or close their doors. This alternative seems hardly reasonable under

existing conditions, and it only remains to be seen how long this defensive attitude will continue. Our prediction of last week in regard to \$11.50 Iron has been realized, and practically until yesterday was the ruling quotation. To-day, however, we are advised of two carloads selling on an \$11.25, Birmingham, basis, which is a very plain indication of the trend of affairs. To go still further, we learn of one consumer needing 1000 tons, which is being held open for \$11, Birmingham, which at this writing we are unable to report upon. We are also advised of a sale of 400 tons of Gray Forge at \$9.75. We are able to learn of but one inquiry of any tonnage, and that is for 600 tons divided between Northern and Southern Foundry from a plant in northern Ohio. There is also an inquiry from a northern Ohio concern for 300 tons of Charcoal Iron for early delivery. Freight rates from Hanging Rock district to Cincinnati, \$1.15, and from Birmingham, \$2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$14.50 to \$14.75
Southern Coke, No. 2.....	14.00 to 14.25
Southern Coke, No. 3.....	13.50 to 13.75
Southern Coke, No. 4.....	13.00 to 13.25
Southern Coke, No. 1 Soft.....	14.50 to 14.75
Southern Coke, No. 2 Soft.....	14.00 to 14.25
Southern Coke, Gray Forge.....	13.00 to 13.25
Southern Coke, Mottled.....	12.50 to 12.75
Ohio Silvery, No. 1.....	19.25 to 19.50
Lake Superior Coke, No. 1.....	16.15 to 16.40
Lake Superior Coke, No. 2.....	15.65 to 15.90
Lake Superior Coke, No. 3.....	15.15 to 15.40

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	\$18.25 to \$18.50
Lake Superior Car Wheel and Malleable.....	18.00 to 18.50

Coke.—There has been some improvement in inquiry as regards Furnace Coke during the week. A number of consumers bought a supply for July, but it is a difficult matter to close contracts for the last half. Prices are about the same as last week. We quote best grades of Connellsville Foundry from \$2.50 to \$2.65, f.o.b. ovens.

Plates and Bars.—Little contracting is being done for next year, and were it otherwise the situation would be in a very congested state. As it is the mills are all crowded with orders, with Structural demand exceedingly active. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in small lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 10-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.83c., in carload lots.

Old Material.—As far as we are able to learn there is very little change in prices over last week's quotations. Business is reported to be very dull and the indications are that there is little doing. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, \$14 to \$15 per net ton; No. 1 Cast Scrap, \$11 to \$11.50 per net ton; Iron Rails, \$17 per gross ton; Steel Rails, rolling mill lengths, \$12.50 per gross ton; Relaying Rails, 56-lb. and upward, \$22 per gross ton; Iron Axles, \$18.50 to \$19 per net ton; Car Wheels, \$15 to \$16 per gross ton; Heavy Melting Scrap, \$12 per gross ton; Low Phosphorus Scrap, \$15 to \$15.50 per gross ton.

Cleveland.

CLEVELAND, OHIO, June 27, 1905.

Iron Ore.—Estimates of the shipments of Iron Ore in June vary from 4,500,000 tons to 5,000,000 tons, though the latter is considered extreme. Dispatch at unloading ports has been fair, being affected somewhat lately by delays to vessels by fog and consequent congestion at docks. The supply of cars continues good. Lake freights are steady at at 75c. from Duluth to Ohio ports, 70c. from Marquette and 60c. from Escanaba. Further buying of Ore has been discussed, but it has not appeared as yet.

Pig Iron.—An appreciably better tone appears in the Pig Iron market, but orders are chiefly for Malleable and Basic. It is reported that upward of 4000 tons of Basic have been sold, with further good buying in Malleable. Lots aggregating 10,000 to 15,000 tons will be placed soon. The market holds at \$14.75 to \$15 for Basic, Malleable and Bessemer, although it is believed a good order for spot delivery might bring the market to \$14.50. The furnaces are not willing to sell for future delivery below what appears to be the market now. There is a report that the United States Steel Corporation will resume dealings with the Bessemer Association, but no inquiry has been received up to the present time. There is a better feeling in the foundry trade. All of the large consumers are still waiting. It is known that some of them will need metal by the middle of July. They are now acting in concert in keeping out of the market. Foundrymen report that there is an increased demand for Castings, some of them saying that their business has not

been in better condition for two years. No. 2 Foundry is now selling on a \$15 basis, although a buyer with a good order for spot delivery might shade that figure somewhat. The Southern producers are still offering No. 2 Foundry in this territory at \$11.75, Birmingham, to which is added a \$3.85 freight rate to Cleveland. The Coke market seems to have struck rock bottom. There is not much available of some makes. The best grades of 72-hour Foundry Coke are selling at \$2.50, with one concern holding for \$2.75. Both prices are for spot shipment. Furnace Coke is quoted at \$2 to \$2.25 at the oven for the best grades.

Finished Iron and Steel.—There is a material improvement in the outlook, yet with no large tonnage booked from this territory during the week. From the standpoint of inquiries, however, it may be said that the market is in much better condition than for some time. In Structural Steel some inquiries have come up which call for deliveries through the remainder of the year, with a good percentage of them asking for material to be delivered through the first quarter of next year. These are not orders so far, but are expected to be in a short time. Another factor is the increased buying by the Cleveland building contractors, who are just extricating themselves from a troublesome situation, due to the fact that they did not cover early in the year. Having paid premium prices most of the year they are now coming in to contract on the association basis. Deliveries on varied specifications are not offered, however, before November 1. The shipbuilding interests have not started to buy as yet, but it is understood arrangements have been made by which they will secure later on considerable tonnage to take care of new boats to be ordered shortly. It is intimated that this tonnage may exceed 30,000. The Sheet mills report an improvement in the tonnage coming in and the market is stiffening. Indications are that fewer of the smaller Sheet makers are cutting prices and therefore that a larger per cent. is going to the big mills. The principal business in this territory continues to be done out of stock, with No. 10 Blue Annealed quoted at 2.15c., and No. 28 One Pass Cold Rolled at 2.65c. The basis on Galvanized Sheets out of stock is still 3.65c. for No. 28. Inquiries are beginning to come in on Steel Bars, although moderate as yet. The small buyers have been covering their needs all along, but the larger interests, especially the agricultural implement makers, have been waiting for more definite crop news and also to catch the possible drift of prices. They are expected to begin to cover shortly, although most of their shops will be closed down during the month of July and some of them into August. The price holds at 1.50c., Pittsburgh, for both Bessemer and Open Hearth. The Bar Iron situation is somewhat stronger. Most of this is due to the fact that some of the mills propose to shut down July 1, to remain idle the better part of that month, but the shutdown of the leading producer will be short. The price holds at 1.50c. to 1.55c. at the mill. The Billet situation is stronger, on the relative scarcity of semifinished Steel. Standard Rails are in better demand, due to the advanced stage of some improvement work in this territory. The market is firm, with an upward tendency, being helped by the better tone in Pig Iron.

Old Material.—One concern in the Valley has been a good buyer of Heavy Melting Steel in the week. Foundries are also reported to be covering their needs for Scrap in a moderate way. Otherwise the market is dull, with prices mostly nominal. We quote, all gross tons: Old Steel Rails, \$13.50 to \$14; Old Iron Rails, \$20 to \$21; Old Car Wheels, \$15 to \$15.50; Heavy Melting Steel, \$13.50. All net tons: Cast Borings, \$7 to \$7.50; No. 1 Railroad Wrought, \$14 to \$14.50; No. 1 Busheling, \$12; Iron Car Axles, \$21 to \$22; No. 1 Cast, \$12.50 to \$13; Stove Plate, \$8.50 to \$9; Iron and Steel Turnings and Drillings, \$9.

Birmingham.

BIRMINGHAM, ALA., June 24, 1905.

The Iron market is blowing both hot and cold, and it is showing conditions that bring some comfort to those who are interested, no matter on which side. During the week prices have run the gamut of a \$1 variation in value; but if any one thinks that the market has declined \$1 in value an encounter with it will quickly dispel the illusion. There is yet some difference between buyers and sellers as to the legitimate value of Iron, and there has not been trading heavy enough to establish definitely correct quotations. But there is a good deal of skirmishing down on, without much being bagged in the way of advantageous results to either side. That the inquiry has increased materially there can be no doubt. That the sales have increased also there is no doubt, though one can hear from some that both inquiry and demand are very slack. There have been no large transactions reported, but the wires have been more or less hot, with bids just enough below the market to make them very uninteresting.

The condition of affairs has been such as to favor the unloading of stock that was lacking in some of the elements

that go to the make-up of grades and yet could be used in certain work to the same advantage as regular grade. On this class of Iron some concessions have been made, and the value obtained has been quoted as the value for a generally accepted grade. To illustrate the irregularity of the market prices, we had five quotations on No. 2 Foundry. The lowest one was at \$11.50; then came \$11.75, then \$12 and \$12.50 and \$12.30. The lower value was taken as a base on which to sell other irregular grades. One of the active interests said it had been in the market every day during the week and had sold every day during the week, and had sold nothing below \$12. Another influential buying firm stated that needing some No. 2 Foundry Iron for prompt shipment it had to pay \$12.50 per ton. Another interest showed registered orders at basis of \$12.30 for No. 2 Foundry, one order being for 500 tons. On the list was an order for 500 tons of Silvery Gray at \$13.50. There were other orders in for this grade at a fluctuation lower in price. Some of them were accepted and on some the price asked was stiffened. Now there were sales at all these prices and no preponderance of moment at any one value.

Under these circumstances no rule can be evolved for accurately quoting grade values. The market is too unsettled to give positive and definite quotations. When the market is in this fix and the buyers begin to take the Silveries freely for that grade one will be safe in the conclusion that some business is being done and that there is plenty to follow. A good deal of business was turned down the past week, part of it being on the basis of \$11.50 for No. 2 Foundry. A number of orders for No. 3 Foundry at \$11 were declined.

There is yet more or less Pig Iron not due being asked for even when maturity of delivery has 60 days to run. When it can be done delivery is made by the seller. There was a noticeable increase in the appearance of round lot buyers the past week, but they were, it seemed, feeling the market rather than relieving it of any stock. But it has been so long since they were in that their reappearance is interpreted as meaning business.

Last week's letter reported the sale by the Tennessee Company of 55,000 tons of Steel Rails for 1906 delivery and stated that the price was "private terms." It is now stated by authority that the sale was at the price and on the terms that have prevailed this year in the sale of Rails. This statement is made to set at rest assertions that a cut price was made to get the business. The names of the buyers are withheld from publication at the discretion of the parties concerned.

Scrap Iron has been very quiet, with dealers full of the belief that with this week it has reached a stopping point. We quote:

Stove Plate.....	\$8.50
Heavy Cast.....	\$10.50 to 10.75
Old Iron Rails.....	17.00
Old Steel Rails.....	12.50
Open Hearth Steel Scrap.....	12.50
Iron Car Axles.....	16.00
Steel Car Axles.....	13.50 to 14.00
Old Car Wheels.....	14.00 to 15.00
Relaying Rails, Light.....	22.00 to 23.00
Relaying Rails, Heavy.....	24.00 to 25.00
Railroad Wrought.....	15.00 to 16.00

The miners' convention has met and formulated its wage scale and had it promptly accepted by those operators who are doing business with the association. The scale is the same as last year, and it makes 47½c. the minimum for mining Coal and 57½c. the maximum. There is no change of attitude toward each other on the part of the strikers and the open mine people. The strike is gradually dissolving and is dying of inanition.

The work being done by the No. 6 Furnace of the Tennessee Company at Ensley is the talk of the furnacemen of the district, and a little later we will be chronicling the advent of a companion furnace to it. It will be begun just as soon as arrangements for its erection can be completed. The installation of electric haulage and the telephone system in the mines is being followed with good results. Another car of miners from Eastern points has arrived and more are to follow. The management reports satisfactory progress in its efforts for greater efficiency and increased output, and says they are above 75 per cent. of normal conditions.

The Southern Sewer Pipe Company has changed ownership. W. S. Dickey has purchased a controlling interest and has become president of the company. J. H. Menge, the treasurer, goes to the Sibley-Menge Pressed Brick Company.

The Sloss mines near Bessemer will install a new compressor and add new machinery to increase their efficiency. They will expend at least \$100,000 in a thorough modernizing of the plant.

The Alabama Steel & Wire Company reports a fine business that keeps the works hustling to meet the demands made upon them.

The report of the supervisor of the industrial census of Connecticut for the year shows an increase of 20 per cent. in the industries of the State, a large part of the gain being of course in the metal lines.

Pittsburgh.

PARK BUILDING, June 28, 1905.—(By Telegraph.)

Pig Iron.—While the Pig Iron market is quiet as far as sales go, there is more inquiry and it is believed that early in July there will be some buying. A number of stacks in the two Valleys have gone out, taking advantage of the present dullness to make needed repairs. This will materially cut down the output and will help the market. A very large tonnage of Iron is piled up at the Valley furnaces, but in spite of this there is no actual demoralization in prices, which are fairly firm. There have not been enough sales of Pig Iron for more than a month to establish prices, but Bessemer and Basic Iron are held nominally at \$14.50 at Valley furnace, or \$15.35, Pittsburgh. It is possible that some sellers would shade this price on a firm offer and on any considerable tonnage. Northern No. 2 Foundry is about \$14.50 to \$14.75 at Valley furnace, with some sellers holding their Iron at \$15. Gray Forge Iron is very dull and we quote Northern brands at \$14, Valley furnace, or \$14.85, Pittsburgh. Some furnaces that have a lower freight rate to Pittsburgh might shade this price 10c. to 15c. a ton.

Steel.—Full details of the large contract for Bessemer and Open Hearth Billets made by the Pittsburgh Steel Company with the United States Steel Corporation are given elsewhere in this issue. There is possibly a little more inquiry for Steel; some consumers whose contracts expire about July 1 are now figuring for last half of the year. We quote Bessemer and Open Hearth Billets at \$22 and Sheet and Tin Bars at \$24, maker's mill. Contracts for delivery over the balance of the year would no doubt be accepted at the official prices, which are \$1 a ton lower than the above. The outlook is that the consumption of Sheet and Tin Bars for the next month or more will be very light, owing to the prospect of the shutdown of a number of the Sheet and Tin Plate mills on account of failure to get the wage scales settled.

(By Mail.)

While nothing of special interest has developed during the week the general feeling in the Iron trade is somewhat better, and specifications on contracts have come in very freely during the last few days, customers desiring to get as much material as possible prior to July 1, on which date a number of mills will close for inventory and wage settlements. The latter applies particularly to the Sheet and Tin Plate mills, no settlement of these scales having been reached, with prospects uncertain, but very strongly in the direction of a general shutdown. The independent Sheet and Tin Plate mills at their conference with the Amalgamated Association last week absolutely refused to sign the scale. The opinion is strongly expressed that the Amalgamated Association has made a serious mistake in asking for any advance in Sheet and Tin Plate wages at this time, and should a long strike occur the association is in very poor condition to make a fight. It has lost a large number of mills during the past year, among these the Carnegie mills at Youngstown and Warren, and its finances are very low.

There is more inquiry for Pig Iron, but as yet actual sales are small and very few. It is estimated there are over 100,000 tons of Pig Iron piled in the two Valleys, and some of the furnaces are getting ready to blow out. The Stewart Iron Company blew out its stack last week, and other furnaces will follow. Bessemer and Basic Pig Iron are nominally \$14.50, at Valley furnace, with reports of small sales, including some Warrant Iron, at slightly lower figures. Northern No. 2 Foundry is about \$14.75, Valley furnace, but on a firm offer \$14.50 could be done. Gray Forge is nominally \$14.50, Valley furnace, but very close to \$14 could be done on a firm offer.

There is some inquiry for Billets and Bars for delivery over third quarter, on which about \$22 for Billets and \$24 for Sheet and Tin Bars is being quoted. Some contracts for Sheet and Tin Bars that are running on a sliding scale basis figure out about these prices, or perhaps a little lower. Specifications on Finished Iron and Steel continue to come in very freely and the mills are getting out as much tonnage as possible prior to July 1. There have been no important changes in prices during the week.

Ferromanganese.—There is some business offering, but mostly in small lots. We quote foreign 80 per cent. Ferro at \$49.50 to \$50, delivered.

Rods.—There is very little inquiry, and we quote Bessemer and Open Hearth Rods at \$32.50 to \$33 and Chain Rods \$33.50 to \$34, maker's mill.

Rails.—Quite a heavy tonnage in Rails has been placed recently and the leading mills have all their tonnage sold for the next two months or longer. In fact, the Rail trade

has been more active recently than for some time, and after July 1 the Carnegie Steel Company will be turning out upward of 5000 tons a day at its mills at Bessemer and Youngstown, the latter mill starting on Rails July 1. We quote Light Rails at \$22.50 to \$25 at mill, depending on sections.

Skelp.—The market is extremely dull and we do not hear of any sales. We quote Bessemer Grooved Skelp at 1.50c. to 1.55c. and Open Hearth 1.55c. to 1.60c., with \$1 advance for Sheared. Grooved Iron Skelp is about 1.60c., and Sheared 1.67½c. to 1.70c., maker's mill. On a firm offer the above prices would no doubt be shaded.

Plates.—Some good sized orders for Plates have been placed in the past week, some of the tonnage being repair work for mills and furnaces, while the Steel car interests continue to use up a very large tonnage. All the leading Plate mills are from six weeks to three months or longer behind in deliveries. We quote: Tank Plates, ¼ inch thick, 6¼ to 14 inches wide, 1.50c., base; over 14 inches wide and up to 100 inches in width, 1.60c., base, at mill, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edges.....	\$0.10
Gauges No. 7 and No. 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 inches.....	.05
Plates over 110 to 115 inches.....	.10
Plates over 115 to 120 inches.....	.15
Plates over 120 to 125 inches.....	.25
Plates over 125 to 130 inches.....	.50
Plates over 130 inches.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)....	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
Marine, "A. B. M. A." and ordinary Fire Box Steel Plates.....	.20
Still Bottom Steel.....	.30
Locomotive Fire Box Steel.....	.50
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.40c. f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Structural Material.—While no large contracts have been placed from this district recently, there is a steady stream of small contracts ranging from 100 to 500 tons or more that aggregate very heavy business. The American Bridge Company has taken some heavy contracts recently, both East and West, and also for elevated railroad work. Bids for the Manhattan Bridge are expected to come out any day, and this work alone will take over 50,000 tons. On the smaller sizes of Beams and Channels ranging from 4-inch up to 8-inch the Structural mills are simply snowed under and are turning tonnage down almost every day, being unable to make deliveries wanted. The Structural trade gives every indication of being active for balance of the year, and tonnage this year will break all previous records. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.60c.; Angles, 8 x 8 and 7 x 3½ inches, 1.70c.; Zees, 3-inch and larger, 1.60c.; Tees, 3-inch and larger, 1.65c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—No settlement of the Sheet scale has been reached with the independent mills and the conference going on at this writing between the American Sheet & Tin Plate Company and the Amalgamated Association is expected to end in a disagreement. It is very probable that all of the union Sheet mills will close down on June 30 and remain idle until the scale is settled. The leading interest will likely continue to operate its nonunion Sheet mills and can easily supply the present demand for Sheets from these plants and which is rather light. The outcome of the conference on Wednesday with the leading interest will very likely determine whether there is to be a strike. Very little new tonnage is being placed in Sheets, but specifications on old contracts are coming in at a fairly satisfactory rate. We quote: Black Sheets, box annealed, one pass through cold rolls, No. 24 gauge, 2.10c.; No. 26, 2.20c.; No. 27, 2.20c.; No. 28, 2.30c. We quote Galvanized Sheets as follows: Nos. 22 and 24, 2.75c. to 2.85c.; Nos. 25 and 26, 2.95c. to 3.05c.; No. 27, 3.13c. to 3.23c.; No. 28, 3.35c. to 3.45c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.65 to \$1.75 per square, and Galvanized Roofing Sheets, No. 28 Gauge, at \$2.85 to \$2.95 for 2½-inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

Iron and Steel Bars.—The leading mills rolling Steel Bars are comfortably filled with tonnage and specifications on old contracts made when prices were 1.40c. or lower are coming in very freely. There is some question just now as to what action the Steel Bar mills will take regarding prices on Steel Bars on large contracts to the implement trade and other leading consumers when present contracts expire. A

report was current last week that prices on Steel Bars on such contracts might be reduced to 1.40c., but we are advised on excellent authority that no such action is contemplated and that prices of Steel Bars will remain at 1.50c. at mill. Some of the larger consumers are holding back placing contracts, believing that a reduction in prices will be made; but the present attitude of the mills does not indicate that this will be done. A moderate amount of tonnage is being placed in Iron Bars and the mills rolling these will continue in steady operation as the scale has been signed. We quote Common Iron Bars at 1.55c. to 1.60c., Pittsburgh, the lower price being made on desirable orders. We quote Steel Bars at 1.50c., base, for carloads and larger lots, but some of the jobbers who have large stocks of Bars on hand bought at low prices are shading 1.50c. to some extent.

Hoops and Bands.—A moderate amount of tonnage is being placed and buyers are specifying very freely on old contracts. We quote Steel Hoops at 1.65c.; Bands, 1.50c., with usual extras, and Cotton Ties, 85c. per bundle for 3000-bundle lots and over.

Tin Plate.—New demand for Tin Plate continues extremely dull and indications point to a general shutdown on July 1 of the mills that sign the Amalgamated scale. The independent Tin Plate mills have already refused to grant any advance in wages for the year beginning July 1 and the leading interest is expected to take the same action at its conference with the Amalgamated Association to be held to-morrow (Wednesday). A shutdown of the Tin Plate mills for a month or two might better the situation, as stocks are still quite heavy, giving an opportunity to work these off. We quote \$3.50, base, f.o.b. Pittsburgh, terms 30 days, or 2 per cent. off for cash in 10 days. Some of the jobbers who have large stocks of Tin Plate bought when prices were lower are shading official prices about 10c. a box.

Spelter.—The market seemed to be a little firmer last week, but demand continues very dull and with a prospect of shutdown of a large number of plants that use Spelter the outlook for a better demand is not very good. We quote prime grades of Western Spelter at 5.05c. to 5.07½c., St. Louis, equal to 5.17½c. to 5.20c., Pittsburgh.

Merchant Pipe.—Conditions in the Pipe trade are showing betterment, jobbers sending in orders more freely and for prompt delivery, thus showing that large stocks held early in the year are being worked off. The outside mills continue to shade discounts of the leading interest two points, or about \$4 a ton. Discounts to jobbers in carload lots, which are shaded to the extent noted above, are as follows:

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
1/4 and 1/2 inch.....	67	51	65	49
3/4 and 1 inch.....	71	59	69	57
1 to 6 inches.....	75	65	73½	63½
7 to 12 inches.....	70	55	68½	53
Extra strong, plain ends.				
1/4 to 3/4 inch.....	60	48	58	46
1/2 to 4 inches.....	67	55	65	53
4 1/2 to 8 inches.....	63	51	61	49
Double extra strong, plain ends, 1/4 to 8 inches.	56	45	54	43

Boiler Tubes.—Reports that prices of Boiler Tubes are being shaded are vigorously denied, the mills being unable to supply the demand and are from six weeks to two months behind in deliveries. It is possible one or two small mills which do not cut much figure in the general market may be cutting prices to get business, but the leading mills are filled up and are holding prices firmly. Discounts in carloads are as follows:

	Iron.	Steel.
1 to 1 1/4 inches.....	41	44
1 1/4 to 2 1/4 inches.....	41	56
2 1/4 inches.....	46	58
2 1/4 to 5 inches.....	53	64
6 to 13 inches.....	41	56

Merchant Steel.—Leading consumers continue to delay making season contracts in the belief that prices may be lower, but the mills are quite firm and the chances are there will be a rush of orders later in the year that will prevent the mills from making prompt deliveries. Prices are reasonably firm and we quote: Toe Calk Steel, 2c. to 2.05c.; Railway Spring Steel, 1.65c. to 1.70c.; Finished Tire, 1.65c. to 1.70c.; Sleigh Shoe, 1.50c. to 1.55c.; Smooth Finished Machinery Steel, 1.70c. to 1.75c.; Cutter Shoes, 2.20c. to 2.25c.; Crucible Tool Steel, ordinary grades, 5½c. to 7c.; special grades of Tool Steel, 10c. and upward. There is a fair demand for Shafting, discounts for Cold Rolled being 50 per cent. off in carloads and 45 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—Demand continues quite active and we quote Railroad Spikes at \$1.70 to \$1.75 per 100 lbs. in carload lots.

Connellsville Coke.—During the week a number of small plants in the Connellsville regions closed down on account of dull demand for Coke and the larger operators are blowing out ovens at a lively rate. Strictly Connellsville Furnace Coke for prompt shipment is being offered at

\$1.75 a ton at oven and 72-hour Foundry Coke at \$2.35 to \$2.50 a ton at oven. On contracts for delivery over last half of the year Connellsville Furnace Coke is held at about \$2 and 72-hour Foundry at about \$2.50 a ton at oven. The cheaper grades of Furnace Coke are offered as low as \$1.50 and Foundry at \$2 to \$2.10 at oven.

Iron and Steel Scrap.—The low prices at which Scrap has been selling for some time are at last attracting buyers, and inquiries in the past week have been more numerous, while more actual tonnage has been sold than for some time. One leading Steel interest has bought in the past two weeks over 10,000 tons of Heavy Melting Scrap and is negotiating for more. It is believed that prices of Scrap are about as low as they will go. We quote: Heavy Melting Scrap, \$13.50 to \$13.75; No. 1 Wrought Scrap, \$15.50; Cast Iron Borings, \$7 to \$7.50; Cast Steel Scrap, \$13.50 to \$14; Wrought Iron Turnings, \$9.50; Bundled Sheet Scrap, \$12; Old Steel Rails, short pieces, \$13.50; long pieces, \$14, all in gross tons, f.o.b. cars Pittsburgh. We do not hear of any recent sales of Scrap in this market.

New York Pig Iron Warrant Market.

NEW YORK, June 28, 1905.

Trading in Pig Iron warrant certificates in the New York Produce Exchange was somewhat quiet during the week past, the sales amounting to but 600 tons, of which 400 were Foundry. February Foundry sold for \$15.25 and \$15.30, July \$15.10, July regular brought \$14.60 and \$14.75. the following quotations were established on call Wednesday noon:

	Regular.		Foundry.	
	Bid.	Asked.	Bid.	Asked.
Cash				
June	\$14.40	.....	.....	.....
July	14.50	\$15.00	\$14.75	\$15.25
August	14.40	.....	14.75	15.25
October	14.40	.....	14.75	15.25
November	14.40	.....	.....	.....
December	14.40	.....	.....	.....
February	14.50	15.00	15.25	15.35

The Sheet and Tin Plate Scales.

After a two days' conference in Pittsburgh last week the wage committees of the independent sheet and tin plate manufacturers and the Amalgamated Association adjourned without reaching a settlement of the sheet and tin plate scales for the year commencing July 1. As stated before, the Amalgamated scale for the new year calls for an advance of 18 per cent. in sheet mill wages and 22 per cent. in tin plate mills, and the manufacturers refuse absolutely to grant any advance. They also want the limit of output removed in both sheet and tin plate mills, but it is possible if the Amalgamated Association will withdraw its demand for an advance in wages that the manufacturers will agree to allow the limit for output to stand.

A conference has been called between the American Sheet & Tin Plate Company and the Amalgamated Association, to be held in Pittsburgh on Wednesday. At this time it is not known what the attitude of the American Sheet & Tin Plate Company will be in regard to the demands of the Amalgamated Association for the heavy advances in the sheet and tin plate scales, but it is altogether likely the company will refuse to grant any advance in wages, following the action of the independent mills. However, should a settlement be reached with the American Sheet & Tin Plate Company it would probably be adopted by the outside mills, which are to have another conference with the Amalgamated Association June 30.

The Thomas Iron Company is blowing in one of the Hokendauqua furnaces. One of the furnaces of the Warwick Iron Company has gone out, and the weakening of the lining will compel the stoppage for repairs of one of the large Wharton furnaces. The small stack will be started to take its place.

The Bethlehem Steel Company is at work on three crank shafts which will weigh 86,600 pounds each when finished. They are turned out of solid steel ingots 25 x 4 x 4 feet and are intended for three Snow gas engines which are to drive 4000-kw. Crocker-Wheeler alternators, said to be the largest gas engine driven generators ever built, ordered by the California Gas & Electric Corporation, San Francisco, Cal.

The Machinery Trade.

NEW YORK, June 27, 1905.

There was no special change in the machinery trade the past week, the general run of orders keeping up fairly well. Machinery houses are closely following the many large projects mentioned in these columns, and in addition are paying a great deal of attention to Japan, the country from which much is expected in the way of orders before very long. They are now making a special effort to capture Japanese trade, and from present indications developments are about to take place in that country which will handsomely reward those who make the proper connections. To this end it would not be surprising to see many American manufacturers appoint special agents in Japan.

Aside from the building of additions and new plants there have been other developments, particularly in the way of improvements to machines and in their use, which have served to increase the demand for machinery. No doubt the machinery trade to-day is in better shape on account of the progress made by many concerns in producing a tool that will do faster and more satisfactory work. The introduction of high speed steel has necessitated the designing of new tools, and the increasing practice of independent motor drives has greatly enlarged the field for the sale of electric motors. Many of these that were innovations are now common practice, and others that were recently but experiments are coming into universal use. Because a machine is found to do a certain work, for which it was not originally intended, faster and therefore more economically the discoverer is able to produce material cheaper than his neighbor, who soon learns the secret. Then one or two spread the news, and before long the machine is being sold for the new work. This change of use is possibly best illustrated at the present time by the increasing sales of automatic screw machines to be used in place of small lathes for making studs. It is said that many of the large companies are now using screw machines for that purpose.

The impetus given to the pneumatic tool business by the recent tunneling operations in and about New York and the extensive operations in those lines still under way has done much to add to the prosperity of manufacturers and sellers in that line of business, and although the usual and expected summer falling off in the trade has lulled activity to an extent there is good promise of plenty of local business. While most of the machinery for the tunneling operations now under way has been purchased there has been more than a fair proportion of pick-up trade from those sources, and it bids fair to continue to such an extent that this summer's business will be better than the corresponding summer months of last year. The prices in the trade are steady, as is natural under good business conditions, and the big companies show no signs of cutting them. The rock drill business is prospering to a pleasing extent for the reasons given above. The operations on the Panama Canal have given to trade in that line an especially pleasing boom, and more rock drilling machinery has been purchased in New York of late than there has been in a long time before. While the outlook at present is only for a pick-up trade, it is thought that there will be enough of that to keep the sales departments fairly busy during the vacation season and the prophets say that business in the fall will be gratifying, judging from the past and present status of the trade.

Chicago Pneumatic Tool Company.

To the machinery trade in general the quarterly meeting of the Chicago Pneumatic Tool Company, held in New York Tuesday, was of more than ordinary interest, in view of the fact that matters were acted upon favorably which will not only necessitate the purchase of a large amount of machinery, but will also increase the company's output to a considerable extent. The company has purchased the Canadian Pneumatic Tool Company, Montreal, Canada, and will take possession of the plant within the next 30 days. This purchase will enable the Chicago Pneumatic Tool Company to transact its Canadian business at a large saving and place it in a better position to handle its business in the Dominion. The price paid for the property is said to be in excess of \$600,000. In consequence of the increasing demand for its pneumatic tools and air compressors the company has been expanding within the past few months. Recently it took over the Philadelphia Pneumatic Tool Company Philadelphia, Pa., and the Chicago Storage Battery Company, Chicago, Ill. Under the management of W. P. Pressenger the air compressor department finds its facilities wholly inadequate to cope with the demand for compressors. As a result a substantial appropriation was made at the meeting of the directors for materially increasing the capacity of the compressor plant at Franklin, Pa. New buildings are to be erected, which will be equipped with the most modern machinery, a list of which will in all probability be presented to the trade for bids in the very near future. The following is the statement for the quarter ending June 30: Gross profits, \$205,488; depreciation and written off, \$29,564; net profit, \$175,923; less reserve for bond interest and sinking funds, \$41,250; profits available for dividends, \$134,673.

Pennsylvania Railroad Machine Tool List.

Our recent announcement of extensive improvements at Altoona is confirmed by the recent action of the Board of Directors of the Pennsylvania Railroad Company, who have authorized the expenditure of some \$600,000 upon a new erecting shop, known as No. 3, which will involve about 1000 tons of structural steel, and the dimensions of which will be 90 feet wide by 400 feet long. In addition to this there will be an extension to the power plant, for which will be required six 450 horse-power water tube boilers, to carry 150 pounds steam pressure. The erecting shop will require two 65-ton electric traveling cranes and six 2-ton electric traveling wall jib cranes and some minor tools, for which the purchasing agent is asking quotations. The work in this shop will be pushed to the utmost and it is expected that the contract will be let and the work completed in three months. Simultaneously with the inquiries for tools which will be used for the erecting shop and the extension to the power plant inquiries are being made for a list of tools for the United Railroads of New Jersey Division, which is the last of the several divisions to make provision for its requirements upon the 1905 programme. The list is made up as follows:

One grinding machine universal tool, belt driven; one bolt cutting machine, size $1\frac{1}{2}$ x 38 inches, belt driven; two steam hammers, 600 pounds capacity, 22-inch stroke; one steam hammer, 800 pounds capacity, 25-inch stroke; two drilling machines, radial, motor driven; one drilling machine, multiple mud ring drill, motor driven; one punch and snear, combined vertical, motor driven; one hydraulic press, 40 tons capacity, 12-inch stroke; one metal working lathe, universal brass turret, belt driven; two metal working lathes, screw cutting engine lathe, back geared, belt driven; one metal working lathe, screw cutting engine, back geared, belt driven; two metal working lathes, 18 inches, belt driven; two metal working lathes, 12 inches, belt driven; one metal working lathe, 2-inch turret, belt driven; one metal working lathe, 3-inch turret, belt driven; one drilling machine, vertical, with square table, belt driven; one drilling machine, vertical, square table, belt driven; one boring machine, 50 inches, belt driven; one shaper, double head traverse, belt driven; two metal planing machines, 30 x 30 inches, motor driven; one metal working lathe, 38 inches, motor driven; eight grinding machines, plain tool, 42 inches; one metal working lathe, 30 inches, motor driven; one metal planing machine, 42 x 42 inches, motor driven; one slotting machine, 26 inches, motor driven; one metal working lathe, turret, belt driven; one boring machine and drilling, horizontal, motor driven; one boring machine, vertical, motor driven; two driving wheel lathes, heavy, motor driven; one driving wheel lathe, 90 inches, motor driven; one punching machine, 48 inches depth of throat, to have a capacity to punch a $1\frac{1}{4}$ -inch diameter hole through 1 inch thickness of material, to be belt driven; one shearing machine, with a capacity to shear 1-inch steel plate or $1\frac{1}{2}$ -inch round bars, depth of throat 48 inches; one 15-ton crane, the bridge and trolley traverse to be hand power and the hoisting to be done by 220-volt direct current motor; ten 30-ton low, 18-inch rise, 27 inches high, hydraulic jacks; four power hammers, one automatic pin spotter, one 42-inch vertical boring mill, with two plain heads; one duplex boiler feed pump, one $1\frac{1}{2}$ -inch triple head bolt threader, one 2-inch triple head bolt threader, one lathe, 13-inch swing; one $1\frac{1}{4}$ -inch bolt cutter and revolving furnace, one power straightening machine for straightening round, square and hexagon stock from $\frac{1}{4}$ to 1 inch in diameter; one 3000-pound steam drop hammer, one No. 4 trimming press, with screw cut off.

Improvements to cost in the neighborhood of \$60,000 have been begun at Norwich, N. Y., by the New York, Ontario & Western Railroad, and before they are completed the machinery trade can look for extensive orders for machine tools, blacksmith shop equipment and the like. The railroad company has under way at Norwich a new roundhouse capable of holding ten engines, to replace an obsolete roundhouse which has been there for years. A machine shop, 100 x 150 feet; blacksmith shop, storehouse and an office building are also among the improvements contemplated. The details of the construction of the buildings are being attended to from Middletown, N. Y. The machine shop will be of modern construction and there will be three tracks through the center. The building will be equipped with a view to handling in it the heaviest kind of work, as well as work of a delicate type. It is understood that none of the machinery requirements for any of the buildings have been purchased as yet. The list of machine tools now being prepared is said to be a large one and it is probable that some cranes and other heavy machine handling equipments will be required. The purchasing will also be done from the Middletown offices. It is said in the trade that the company also intends to install some new machinery at its Middletown shops, but no announcement has been made as yet as to the extent of the improvement.

Important Machinery Requirements.

Considerable new machinery will probably soon be purchased by the Landis Machine Company, Waynesboro, Pa.,

which is to build an addition to its plant that will more than double the present capacity for the manufacture of its bolt cutter, invented by A. B. Landis. The new building is to be uniform in design with the present shop and will be 80 x 115 feet, one story. It will be equipped with the latest machinery, and contracts for its construction will be placed as soon as possible, with a view of having the shop in operation by September 1. With the additional manufacturing facilities the company hopes to be able to take care of its orders, which are coming in so fast that it would take two months with the present facilities to fill those already in hand, exclusive of the new orders which are coming in daily.

Contract has been let for the new building which the American Locomotive Company is preparing to erect at Providence, R. I., for the manufacture of the Berleit automobiles. It will be a fire proof structure 65 x 335 feet, three stories in height. The building will be used almost entirely as a machine shop and the fine work in the manufacture of the automobiles will be done there. Consequently the company will have to purchase a large quantity of machine tools. The heavier work will be done at the locomotive plant at Providence. The machinery details for the plant have not been completed as yet. It is more than probable that New York machinery dealers will get a large proportion of the orders, as the company invariably gives New York houses a chance to bid on its requirements when the place of delivery is as close to this city as Providence. The first machines to be turned out at the Providence plant will be 25 and 40 horse-power, but later on the company will no doubt build automobiles of the heaviest type. It is not thought that the corporation will confine its output to the Providence plant alone as the invasion of the automobile field continues, and it will not be surprising to hear of other plants being established for the manufacture of the machines.

The Cambria Steel Company has been sending out inquiries of late in and about New York for various equipments for its Johnstown, Pa., shops. The company is now getting bids on a 25-ton special crane and two 10-ton cranes of special design. The company has New York offices in the Trinity Building.

Boiler makers' punches, shears, rolls, pneumatic tools, trip hammers, bolt cutters, several lathes, shaper, traveling crane and various other tools are required by the Fargo Iron & Foundry Company, Fargo, N. D., which was recently incorporated with a capital stock of \$50,000. The company, which takes over the Parson Kellman Iron Works, Litchfield, Minn., and the T. L. Sykes Boiler Machine Works, Fargo, N. D., will erect a new plant in the latter city for the manufacture of gasoline engines, agricultural machinery, boilers, tanks, smoke stacks and all kinds of architectural iron work.

The Riverside Foundry & Machine Works, Pittston, Pa., J. A. Touhill, proprietor, which recently secured the property at Scranton, Pa., formerly used by the Lackawanna Iron & Steel Company, is now purchasing machinery for equipping the shops at the latter place. While it is the purpose of the company to open up as soon as possible in its Scranton works, it is not among the present plans to abandon the Pittston plant. There are several large brick buildings on the Scranton property, the main one being a foundry, 60 x 106 feet, with two annexes, 47 x 87 and 44 x 46 feet, respectively. The plant also includes a pattern shop, 36 x 66 feet. A machine shop, 60 x 200 feet, is well under way toward completion, together with a new boiler shop. Eventually the Pittston shop will be abandoned and the machinery there will be moved to Scranton.

Zschoke's Engineering Company of Kaiserslauten, Bavaria, is in the market for an automatic boring and drilling machine for wooden bobbin tubes.

The Simplicites Auto Company, Middletown, Conn., which occupies the former premises of the Annual Wind Clock Company, is now in the market for a shaper, milling machine and boring mill.

The Rainy River Improvement Company, Fort Francis, Ontario, and International Falls, Minn., has a large project under way for which it will shortly purchase machinery in all probability. Joseph H. Wallace, who has an office at 5 Beekman street, New York, is representing the company as a purchasing agent, and he has inquiries in the market for an extensive list. The list includes 14 500-kw. generators, 12 350 horse-power motors, 4 150 horse-power motors, 7 75 horse-power motors, 12 40 horse-power motors, 10 30 horse-power motors and 9 20 horse-power motors.

The Standard Concrete Steel Company has been organized with a capital of \$500,000, for the purpose of carrying on a general fire proof construction, equipment and building business on a large scale. The new company has taken over the plant and business of the Guy B. Waite Company. The latter concern owned a large plant at Thirty-first street, Thirty-second street and the East River, which is now the property of the Standard Concrete Company. The new corporation has opened offices at 100 Broadway, New York, and plans are under way for the extension of the plant. The company expects to greatly enlarge the plant, and no doubt a

considerable amount of machinery will be needed to carry out the project. The directors of the concern are John F. Havemeyer, Guy B. Waite, Henry L. McGee, William B. Nisbet, Samuel A. Simpson, Jesse Grant Roe and Leonard I. Roe. The Waite Company will finish all its existing contracts, but new business will be looked after by the new company, which already has a number of large contracts in hand.

The American Woodworking Machinery Company, 136 Cortlandt street, New York, has bought 10 acres of land at Gates, L. I., where eventually it will erect a large plant. It is announced, however, that it is not the intention of the company to take up the matter just yet, and no plans for the proposed structure will be made for some time. The company has a plant on the outskirts of Rochester and will continue the manufacture of its product there for the time being.

The Union Machine Company, Nashville, Tenn., has been reorganized under the name of the Union Machine & Supply Company, and the capital stock has been increased from \$25,000 to \$60,000 for the purpose of adding a complete mill supply business to its already extensive machine business, which includes the manufacture of electric belt power and hand power elevators, stave bolt equalizers, swing cut off saw machines, hand feed edgers, &c. The company is now in the market for a full line of mill supplies of all descriptions and would like to receive catalogues and discounts from manufacturers. The manufacturing department consists of a machine shop and supply department, 110 x 120 feet, and a foundry, 75 x 150 feet. The new members of the company are practical machinery and supply salesmen, and contracts have been made with the following concerns for the exclusive agency for their goods in the Nashville territory; I. B. Williams & Sons, leather belting and lace leather; Gutta Percha Rubber Mfg. Company, rubber belting, packing and hose; Mt. Vernon Belting Company, canvas stitched belting; Oneida Pulley Company, wood and steel split pulleys, and the Curtis Mfg. Company, saws and saw mill machinery.

Municipal Work.

The high pressure salt water fire protection system for New York bids fair to be a reality in the very near future, especially in the Borough of Brooklyn, plans for the construction of the system in that borough having progressed to the point where the Commissioner of Water Supply, Gas and Electricity is now asking bids for the electric pumps and other appurtenances, including the motors, pipe, valves, switches, instrument connections, &c. The Brooklyn system will serve the entire water front and will contain two pumping stations equipped with electric pumps driven by induction motors using the Edison current. The main station, which will be located at Joralemon and Furman streets, will be of 3750 horse-power capacity divided into 5 units, and bids are now being asked for the five electrically driven pumps and appliances which will be used in that station. The other station will be erected at Willoughby and St. Edward streets and will be of 2250 horse-power capacity divided into three units, and bids are now being asked for the three electrically driven pumps and appurtenances to be installed at that point. The bids will be opened July 19.

Plans have been accepted by Borough President Littleton, Brooklyn, N. Y., for what is said to be the largest relief sewer ever constructed in the United States. This sewer is for the relief of the upper section of Williamsburgh and a section of the Borough of Queens and will be a veritable underground tunnel. It will be 4 miles in length and will cost in the neighborhood of \$4,000,000.

Bids will be opened next Wednesday by the Department of Public Charities of the City of New York for furnishing the material and erecting a garbage crematory at Randall's Island. The plant will include engines and boilers, conveying machinery and the like.

Bids will be received on July 5 by the Department of Health of the City of New York for a new boiler to be installed in the boiler house at the Riverside Hospital, North Brother Island.

The Jewish Hospital at St. Mark's place and Classon avenue, Brooklyn, is in the market for new electric equipment. The plant is to be of 225 horse-power, and the purchasing will be done from the hospital offices.

The Luzerne County Brewing Company, Wilkes-Barre, Pa., is purchasing machinery for its plant there, and has inquiries in the market for electrical equipment of various descriptions.

The Boston Metal Trades Association has elected the following officers for the ensuing year: President, D. D. Russell, James Russell Boiler Works Company, South Boston; vice-president, Fred. F. Stockwell, Barbour-Stockwell Company, Cambridge; treasurer, A. L. Lovejoy, Becker-Brainard Milling Machine Company, Hyde Park; secretary, E. P. Robinson, Atlantic Works, East Boston. The vacancy caused by the death of Frank A. Wilson, secretary of the Boston Labor Bureau, has not yet been filled.

New England Machinery Market.

WORCESTER, MASS., June 27, 1905.

Conditions have changed in no noticeable way during the past week. Business appears to have let up to some extent, which may be attributed in a degree to the entirely unsatisfactory weather, but probably more to the fact that the vacation season is at hand. It is no serious matter in the minds of manufacturers and dealers, but rather a postponement of first-rate business until the autumn. The labor bureaus continue to make encouraging reports of demand for workmen in the metal lines and the growing scarcity of skilled men applying for positions. This goes to show that while the demand may be slackening, the purpose of many manufacturers of machine tools is to provide for future demand by replenishing stock and having on hand sufficient tools to meet a sharp demand for immediate delivery.

The Whitcomb-Blaisdell Machine Tool Company.

An important announcement to the trade is that of the merger of the Whitcomb Mfg. Company, P. Blaisdell & Co. and the Whitcomb Foundry Company, Worcester, Mass., into a new corporation known as the Whitcomb-Blaisdell Machine Tool Company. Both the Whitcomb Mfg. Company and P. Blaisdell & Co. are old concerns of widespread reputation for their high class machine tools, the Whitcomb Company for its metal planers and Blaisdell & Co. for their engine lathes. Each has its other lines, which will be continued, including the Whitcomb shears and punches and the Blaisdell drills; but the planer and lathe will be the features of the new company's product, in addition to castings from the foundry. There will be no change in the personnel of the active management of the several establishments, excepting that already noted in *The Iron Age*, of the retirement of Enoch Earle and John P. Jones from the firm of P. Blaisdell & Co., which was a step preliminary to the organization of the new corporation. Alonzo W. Whitcomb, treasurer of the Whitcomb Mfg. Company and the Whitcomb Foundry Company, is the president of the Whitcomb-Blaisdell Machine Tool Company, and Charles E. Hildreth of P. Blaisdell & Co. is the vice-president and treasurer. Samuel H. Clary, treasurer of the Worcester Trust Company, is the clerk of the corporation, and these three officers, with W. A. Blaisdell and C. G. Whitcomb, constitute the Board of Directors. The office of the company will be at the Whitcomb shop on Gold street.

The several plants will be operated for the present with no material changes. Provision for the future has been made by the purchase of a tract of land at South Worcester with 450 feet of frontage on the Norwich & Worcester division of the New York, New Haven & Hartford Railroad, containing 136,000 square feet. It is not the purpose of the company to build a new plant immediately. Consideration will not be given this matter until all the details of the management and general conduct of the business have been worked out. The business will be run under three departments, the Whitcomb planer department, the Blaisdell lathe department and the foundry department. The well-known names of the Whitcomb planer and Blaisdell lathe will not be changed to conform to the corporate name of the new company.

The business of the Whitcomb Mfg. Company was established in 1849 by Carter and Alonzo Whitcomb, father of A. W. Whitcomb, under the firm name of C. Whitcomb & Co. Copying presses were the first product, and afterward planers, drills and lathes were added to the line, the lathe and drill being given up later. Alonzo Whitcomb formed another partnership with Augustus Rice, as Rice & Whitcomb, for the manufacture of metal shears and punches, and the lines were afterward merged into the Whitcomb business. Carter Whitcomb retired 30 years ago, and Alonzo Whitcomb continued the business until his death, in 1900. The business was then incorporated as the Whitcomb Mfg. Company. The business of P. Blaisdell & Co. was established in 1865 by Parritt Blaisdell and Charles Wood. Mr. Wood remained in the firm but a short time and John P. Jones became a partner. In 1873 Samuel E. Hildreth, the father of Charles E. Hildreth, purchased an interest in the business and remained its head until his death, in 1893. Enoch Earle's partnership began soon after the death of Parritt Blaisdell, in 1875. The Whitcomb Foundry Company operates one of the largest of Worcester's foundries. The business was established in 1885 under the firm name of A. Kabley & Co., the partners being Arnold Kabley, Alonzo Whitcomb and F. E. Reed. The business was incorporated as the Kabley Foundry Company in 1895 and in 1900 the Whitcomb Estate purchased the Reed and Kabley interests. The name was changed to the Whitcomb Foundry Company in 1904. A new foundry building has just been completed, replacing the old foundry and at the same time materially enlarging the plant.

The Meriden Firearms Company, Meriden, Conn., which recently moved from Hopkinton, Mass., to that city, is planning to erect a new power house, 60 x 120 feet. The company states that it is in the market for two engines of

about 250 horse-power each and either two or three boilers of 150 horse-power each. Nothing has been decided as to type of engine to be purchased. Neither has the boiler question been settled.

Thomas Crowther, Lawrence, Mass., who has been connected with Chandler & Farquhar, Boston, for the past nine years, will open an office in Boston for the sale of the products of the Chandler Planer Company, Athol, Mass.; W. P. Davis Machine Company, Rochester, N. Y., and the Garvin Machine Company, New York.

The Protected Metal Company, Springfield, Mass., is in the market for a corrugating machine, a ridge roll forming machine and a light hand shear for steel plate. The company, which was recently organized to manufacture a metallic roofing, has not yet fully determined where it will locate its plant, having several sites in mind. However, it is ready to purchase the machines as stated.

El. M. Woodward has been elected president and treasurer of the Woodward & Powell Planer Company, Worcester, Mass.; A. M. Powell, vice-president and shop superintendent, and John W. Robinson, clerk of the stockholders and secretary of the corporation, the three officers forming the Board of Directors. The management will remain as it has been since Messrs. Woodward and Powell became associated in the planer business, 18 years ago.

The new building which Harvey Hubbell, Bridgeport, Conn., manufacturer of machine tools and electrical specialties, will add to his works will be 41 x 147 feet, one story, with saw tooth roof.

The Carter & Hakes Machine Company, Winsted, Conn., is now comfortably settled in its new shops in that town, the buildings being nicely adapted to the company's purpose, the manufacture of machine tools. A substantial water power is an adjunct of the plant. The company lost its former shop by fire several months ago.

The Holyoke Water Power Company, Holyoke, Mass., will soon be in the market for the equipment of its new power house, which will utilize water power now going to waste to generate 2600 horse-power in electrical energy. Details of the equipment are not fully determined, but the company will probably install to start with one 500-kw. steam turbine and direct connected generator and three boilers for an auxiliary steam plant, two 600 kw. generators direct connected to water wheel shaft and two pairs of 42-inch horizontal water turbines, with the necessary pumps, condensing apparatus, feed water heaters, &c. The general plan for developing the water power has been given in some detail in this column.

The Bodwell Water Power Company, Milford, Maine, has been organized to develop water privileges at Old Town, Maine, where 8000 horse-power of electric energy will be generated, the purpose being to sell the power in the Penobscot Valley. The officers are: President, Charles V. Lord; treasurer, W. P. Hubbard; directors, these officers and Franklin A. Wilson, J. Fred Webster and Carl P. Dennett. It is planned to spend about \$1,000,000 on the enterprise. Farson, Leach & Co., New York, are the financial agents of the company.

The Monument Mills, Housatonic, Mass., cotton manufacturers, are making plans for developing a water privilege some 2 miles from the mills, the general purpose being to establish an electric plant and transmit the power to the mills. The company is not yet ready to make definite announcement of its plans.

Chicago Machinery Market.

CHICAGO, ILL., June 27, 1905.

Machinery business is looking up, particularly in the line of machine tools, which for some time have been rather dull. A local demand for lathes and planers has developed that has done much to clear the floors of some of the Canal street houses. An unusually large percentage of machinery buyers appeared in person at the Chicago stores in proportion to mail orders, and the local selling forces are busier than they have been for several months. In addition to the current business of a general character the railroad requirements are just now unusually large. The largest buyer is the Santa Fé with three heavy lists out, as noted below. The Pennsylvania lines west of Pittsburgh are also in the market for about 60 machine tools, which were described on a list dated May 31, bids on which were supposed to have been closed June 7, but awards on which have not yet been made. The Allis-Chalmers new addition at West Allis will call for large machinery requirements, but as far as can be learned bids have not been asked for. In this connection there is much interest shown on the street as to the outcome of the forthcoming meeting of the directors of the company. It is generally supposed that Benjamin H. Warren, the president, will retire along with W. J. Chalmers, who is still, nominally at least, its treasurer. The new plant of the Chalmers-Williams Company at Chicago Heights is quite generally supposed to be a move on the part of Mr. Chalmers to have something worth while to step into when he thinks

it advisable to withdraw from the large company, which he was so active a factor in organizing, notwithstanding the fact that the Chicago Heights company is officered by his son and the son of Norman Williams. The Kennicott Water Softener Company has pretty well formulated its plans for its new plant and some of the machine tools have been bought, though information at the present writing is not forthcoming as to what these are. Requirements for the new plant of the Morden Frog & Crossing Works, at Chicago Heights, will also be large, and it will not be long before we will be able to give definite information in that particular also. Boiler shops are as a general rule very busy, the smaller ones in repair and local construction work and the larger ones in the fabrication of steam boilers. Bridge shops are almost without exception busy, the American Bridge Company having apparently reached a point where it is so full of business that it does not make much effort to secure small work, the result being that the local shops all over the country are booking a nice line of business of the smaller character. Much of this business is done on the basis of the purchase of structural steel from store, as mills are many months behind in the delivery of structural steel.

Large Santa Fe Requirements.

The Santa Fe road has issued three separate lists for machine tools, aggregating 110 items of various kinds, including engines and boilers. Of these the list dated April 28 for 66 items, mainly metal working machine tools, has been for the most part placed. Niles-Bement-Pond Company secured the bulk of the business, while special tools were given out to other concerns, among which are the following: Five air compressors, Laidlaw-Dunn-Gordon Company; one turret lathe, Jones & Lamson; one large punch and shear, Williams, White & Co.; three pumps for washing out locomotive boilers, Fairbanks, Morse & Co.; timber dressing machines, Berlin Machine Works, and a number of machine tools to Manning, Maxwell & Moore and McDowell, Stocker & Co. Electric traveling cranes specified on the list have not been placed.

A second list of a miscellaneous character is dated June 20, which consists largely of requirements for sheet metal working shops, bids on which must be in the hands of the purchasing agent at Chicago by July 1. The list includes the following: One Stow wiring machine, one Stow setting down machine, one Stow turning machine, two Stow burring machines, one Stow beading machine, one Stow combined ring and circular shears, one Waugh circular shear, one Stow bar tin folder, two Stow turning machines, one Stow wiring machine, two Stow burring machines, one Stow beading machine, one tinner's bench shears, one tinner's beakhorn stake, one tinner's candle mold stake, one Stow incased groover, one Stow incased setting down machine, one Grannis slip roll former, one Cleveland countersinking radial drill, one Henry Troemner sealers' adjusting balance, three Prentiss iron workers' vises, one General Electric or equivalent 5 horse-power motor, two 50-ton Watson-Stillman hydraulic jacks, two 35-ton Norton jacks, one Sturtevant steel pressure blower, one General Electric or equivalent 40 horse-power direct current motor, one side suction diaphragm trench pump, two Babcock & Wilcox 300 horse-power water tube boilers, one Colles heater, filter, purifier, oil separator and condensation receiver; two 8 x 5 x 10 plunger pumps. Two motors, one 5 horse-power and the other 30 horse-power, have been let to the General Electric Company. These bids are all in and consideration is being given to them by the officers interested. Bids have also been received by the Atchison, Topeka and Santa Fe Railroad for the following list of power and electrical equipment for a grain elevator at Argentine, Kan.: Two tandem compound noncondensing horizontal engines, 210 to 250 horse-power, suitable for direct connection to 150-kw. generators; one tandem compound noncondensing engine, 110 to 150 horse-power, suitable for direct connection to 75-kw. generator; one simple noncondensing horizontal engine, 45 to 50 horse-power; two 150-kw. alternating current generators; one 75-kw. alternating current generator; two direct current 125-volt generators; one complete electric switchboard suitable for controlling two 150-kw. and one 75-kw. generators; two 30 horse-power 440-volt 60-cycle induction motors; one 30 horse-power induction motor; 21 single pole arresters suitable for use on 440 volts; 12 single pole lightning arresters suitable for pole line use on 440 volts. We are informed by officers of the company that quite a number of the tools specified on these three lists will not be purchased immediately, as it has been ascertained by the officials of the road that the total cost will exceed the current appropriation for machinery.

The Toronto Gas & Gasoline Engine Company, Limited, Toronto Junction, Ont., is building a new plant, comprising machine shop, 80 x 240 feet; a wing for testing and painting, 40 x 80 feet, and large offices and showrooms. Tenders are now being received on machinery for the equipment of a first-class gas and gasoline engine plant. A large turret lathe has been purchased from the Niles-Bement-Pond Company, New York, and specifications are being taken on two large boring mills.

M. Brady & Sons, proprietors of the Michigan Iron & Metal Company, Grand Rapids, Mich., are erecting a machine shop, 50 x 150 feet, with a wing in which will be the offices of the firm. Tool equipment will be purchased in about 30 days.

The Peoria Automatic Gas Machine Company, Peoria, Ill., recently incorporated, will require general machine shop equipment, and also sheet metal working machinery.

Power Work.

The Commonwealth Electric Company, Chicago, which is part of the Chicago Edison Company, is making extensive additions to its Fisk street power plant, the engineering work being in the hands of Sargent & Lundy, Chicago. These involve the erection of an addition to the present building 85 x 260 feet, the building being erected by Shepley, Rutan & Coolidge, Chicago. The machinery equipment includes a 5000-kw. Curtis turbine, which is now being installed, and two additional turbines of the same type have been ordered from the General Electric Company, Schenectady, N. Y., each 8000-kw. nominal and 12,000-kw. maximum capacity. Seventy-two Babcock & Wilcox water tube boilers, each 530 horse-power rated capacity, have been ordered to furnish the necessary steam for these turbines. Contract for the coal and ash handling machinery to be installed has been let to the John A. Mead Mfg. Company, Chicago, and the General Electric Company has been given the contract for condensers. This addition of about 35,000 horse-power to the present turbine plant of the company is taken as a decisive refutation of the many stories that have been going the rounds for the last year to the effect that steam turbines have been a failure in this installation. Officers of the company are emphatic in stating that notwithstanding the fact that the turbines when installed were almost in an experimental stage and required considerable changing and repairing their efficiency has been so great as to make the total operating cost, including repairs, considerably less than had been obtained previously by the use of steam engines. Still greater efficiency is expected from the new turbines, as important improvements have been made since the first three 5000-kw. units were installed. The plant is admirably located for receiving its fuel direct from lake vessels and is becoming an increasingly potent factor in furnishing power to local manufacturing industries.

The Toluca Electric Light & Power Company, Toluca, Mexico, has decided to develop water power concessions in the River Verde at Temascaltepec and Sauteppec, which will provide immediately 3000 horse-power and ultimately 8000 horse-power. The first installation will include a dam to be built of solid masonry laid in cement, the dam being 66 feet high and 66 feet long at its crest. This dam is to furnish water at the rate of 190,000 gallons a minute, which will be conveyed to the power house through a masonry canal 2950 feet long, where it will have a head of 328 feet. The power house will be a masonry structure, steel trussed roof, covered with corrugated iron, and will include besides its hydraulic equipment an 8-ton traveling crane. The penstock will be made of riveted boiler steel 48 inches in diameter. The power house will contain in it four 400-kw. generators, direct connected to impulse wheels. Three-phase 25,000-volt transmission lines will be strung from the power house in two directions, one to Sauteppec, 11 miles distant, and one to Zacualpam, 22 miles distant, at which latter point power will be furnished to silver mines. R. J. M. Danley is general manager and chief engineer of the company. The work will be rushed to completion.

The H. W. Caldwell & Son Company, Chicago, is building an extensive power equipment for Barnard Stern & Sons, operating a large flouring mill at Milwaukee. A feature of this equipment will be a beveled mortise wheel, which is described by its makers as being the largest in point of contact surface of any wheel thus far built.

One of the most interesting water power installations of the present day is a new plant just built by the Oliver Chilled Plow Works, at South Bend, Ind. This plant consists of 12 water wheels built by James Leffel & Co., Springfield, Ohio, in three sets of four each, aggregating 4200 horse-power. Each unit of four wheels is connected through suitable appliances to a 500-kw. Westinghouse generator. The transmission appliances were supplied by the Dodge Mfg. Company, Mishawaka, Ind. This machinery is installed in a concrete power station.

The Twin City Rapid Transit Company, which operates an electric line between St. Paul and Minneapolis, has ordered a 3500-kw. unit, consisting of an Allis-Chalmers reciprocating engine and a General Electric generator. This equipment duplicates the old plant, and the company is contemplating a still greater increase which will call for one or more steam turbines aggregating 5000 kw. Bids on this latter equipment have not yet been asked for, but it is practically certain that it will be purchased. Sargent & Lundy, Chicago, are the engineers in charge.

Contract for the four pumping engines for the Lawrence avenue pumping station, Chicago, mentioned in the machinery market of June 8, was let to the Allis-Chalmers Company for \$127,900. The only other bidder was the

Camden Iron Works, Camden, N. J., whose bid was \$129,000.

The Tonopah Mining Company of Nevada, Tonopah, Nev., is building a new power plant at Millers Siding, 15 miles west of Tonopah. It will be a steam plant for generating electricity, which will deliver 1000 horse-power at the switchboard and will be transmitted to Tonopah and distributed to the various shafts of the mining company and its allied interests. A mill will also be constructed close to the power plant, which will consume some of the power generated. The plant consists of Babcock & Wilcox boilers, McIntosh & Seymour engines, Westinghouse electrical equipment and line installation. Electric hoists will be used on all the mines and electric power in the mill.

The Indianapolis & Chicago Air Line Traction Company, Indianapolis, Ind., is preparing specifications for certain power requirements for its line. J. A. Shafer is chief engineer.

An interesting and important power development is now being undertaken by the Deadwood Power & Light Company, Deadwood, S. D. The company's present plant at Pluma, S. D., which supplies electricity to both Deadwood and Lead, comprises three 500 horse-power internally fired water tube boilers built by S. Freeman & Sons, Racine, Wis., and two De Laval steam turbines of 200 kw. each. To this plant will be added right away two 1500-kw. Curtis turbines and one 500-kw. of the same type. Necessary boilers for this installation have not yet been purchased, but bids will be called for in a few days. The purchases will be made by M. E. Franklin, cashier of the National Bank, Deadwood, S. D. Sargent & Lundy, Chicago, are the engineers in charge of the work.

The National Brick Company, Chicago, a new corporation, which will build three plants near Chicago for the manufacture of common brick, has secured its charter and details of the plants are now available. A site of 180 acres of land has been secured at Maynard, Ind.; another of 80 acres at Chicago Heights and a third of 80 acres at Weber Junction, on the Chicago & Northwestern Railroad, just west of Evanston, Ill. The buildings, with their equipments, will cost about \$500,000, and each plant will be provided with practically the same floor space and machinery. The buildings for each plant will comprise two driers, each 125 x 140 feet; a boiler room, 60 x 142 feet; a machine room, 40 x 80 feet, and an engine room, 40 x 80 feet. Contract for all the brick machinery has been let to the Chambers Brothers Company, Philadelphia. Each boiler house will be equipped with four Brownell boilers of 125 horse-power and one Dutch oven. The Filer & Stowell Company, Milwaukee, will furnish a 26 x 48 inch engine for the Weber plant, and the Allis-Chalmers Company one each of the same size for the Maynard and Chicago Heights plants. The Barron Drier Company has the contract for 2400 driers. Green chain grate stokers are provided for the Weber and Chicago Heights plants, and Jones underfeed stokers will be used at Maynard. Lighting equipment for each plant, which will include a 40-kw. generator and 6 horse-power motors, is being figured on. James B. Clow & Sons, Chicago, have the contract for 225,000 feet of piping. Each plant will have a capacity of 400,000 bricks per day and the company now expects to begin operations about September 1. The officers are B. F. Weber, president; F. W. Labahn, vice-president; Henry Busse, secretary, and Louis Riemer, treasurer.

Business Changes.

The Illinois Foundry & Engineering Company has transferred its selling headquarters from its factory at Granite City, Ill., to 504 Fullerton Building, St. Louis. The company will also maintain an office at its plant. E. A. Miller is president and general manager and R. W. Price secretary and treasurer.

Cincinnati Machinery Market.

CINCINNATI, OHIO, June 27, 1905.

A review of the local situation during the past week indicates that there has been a slight falling off in orders in a number of the plants. This does not apply to all varieties of tools nor to all the shops, but to certain special cases only. There is nothing unusual in the situation, however, as the summer months are generally regarded as dull and productive of very little new business. Foreign demand is still on the increase; a large percentage of the concerns in this city are beholden to this fact for the condition of their order books to-day. A great scarcity of first-class machinists is reported, and it is almost impossible to secure apprentices that meet the requirements of the demand. Prices for machine tools are said to be unusually strong, and the tendency is to a higher plane. We are now able to report a termination of the structural iron workers' strike that has been on for several months. The basis of settlement makes the minimum rate of wages less than the former agreement, with the inside workers on a strictly open shop plan. As to the outside or erecting men a union agreement was made. The employees in some ways received more than they demanded

at the beginning of the strike, and all are apparently for the time being satisfied.

The Champion Tool Works Company, with a capital of \$15,000, was incorporated this week by Thomas Bentham, H. W. Kreuzberg, W. Donaldson, Edward McGoldrick, J. G. Dinklebiller, Jr., and O. B. Kreuzberg. Its new building on Spring Grove avenue is now completed and it started up this week with a full complement of men. The machinery is all installed and it expects to complete its first lot of lathes by the middle of next month.

Blymyer Iron Works Company reports a large development along foreign lines. It has recently added to its working force two foreigners, one from Mexico and one from Central America. The former is employed in the office of the plant and the latter in the factory. The company figures that this is one way of developing export business—by making them familiar with the products of the country, so that when they return to their native land they make good agents without salary. The company has recently had printed an elaborate Spanish catalogue which is very handsome.

Schumacher & Boye say that they have considerable business booked. Export trade is very flattering and is growing. Prices are said to be firmly maintained.

The John Steptoe Shaper Company says it is experiencing great difficulty in securing machinists to suit. It has not felt the approach of anything like dullness and is well provided for as far as orders are concerned.

The Rahn-Mayer-Carpenter Company is continuing to add new tools and has increased the facilities of its plant considerably. The company reports being unable to accumulate any stock, and if present conditions continue for any length of time it may find it necessary to utilize more space for equipment.

The Cincinnati Machine Tool Company advises that a more general run of orders has been received during the past week than for several weeks prior. Conditions with the company have assumed a more quiet attitude, and a fair normal business obtains.

The Cincinnati Milling Machine Company is exceptionally busy, demand coming from both foreign and domestic sources. The iron work is now being erected for the new building and work is progressing in a very satisfactory manner.

Philadelphia Machinery Market.

PHILADELPHIA, PA., June 27, 1905.

The local machinery market continues fairly active. While there is no particularly heavy individual orders for general equipment, there is a good average run of smaller business, the aggregate of which is said to reach quite satisfactory figures. No particular class of tools or machinery seems to be in special demand, sales covering a range of all classes and sizes. The railroads continue to take a fair run of tools, mostly for replacement and for minor extensions at their various shops; there is also some inquiry for small plant equipment, but the major part of the week's business has been made up of orders for one or more tools from various sources for general equipment. The award for the equipment of the new Northeast Manual Training School for this city is expected to be made during the present week, but it is understood that many items in the original specifications have been cut out, reducing the amount of the contract quite considerably.

Inquiries, considering the season of the year, keep up very satisfactorily; usually at this season of the year a marked falling off is noticeable, but as yet no indication of any decline is to be seen.

Manufacturers as a rule keep busy; in some instances the capacities of plants are being taxed to meet requirements; in other cases, however, there is not so active a demand, and while manufacturers in the latter class have business enough to keep their plants running regularly they could conveniently handle a much larger amount of work.

In some fields there has been a slight improvement in the foreign demand, but this is largely in lines already established. No strictly new business of moment is to be noted in this branch of the trade.

Additional permits have been taken out for the erection of further buildings for the new lace making plant of the Lehigh Mfg. Company. Wm. Steele & Sons, contractors, who have had previous contracts, will also erect this building which is to be four stories high, 44 x 180 feet, situated on Somerset street, below Twenty-second. The cost of this particular building will be \$160,000. Details of the entire plant to be built by the above concern were given recently in these columns.

Samuel H. Garrett, engineer and contractor, will shortly be in the market for a rock crusher 13 x 24 inches or thereabout, a ten-stamp mill and a 50-foot elevator for an operation on which work will be started in the near future.

The Wm. Cramp & Sons Ship & Engine Building Company has a large amount of work under way, and the yard is busy in all departments. This company has considerable in the nature of plant improvement under consideration; a one-story reducing plant will be built at the corner of Adams

and Almond streets, and additions and alterations are contemplated to the core making shop and to the office building. Contracts have recently been made by the Cramp Company for several new vessels, including a large one for the Ward Line.

The Betts Machine Company, Wilmington, Del., is busy in the various departments of its plant. The demand for heavy machine tools is good and a number of satisfactory orders have been booked. This company has recently shipped eight standard Betts boring mills to the Standard Steel Works, Burnham, Pa., making a total of 44 of these tools that it has furnished that concern. It has also shipped four extra heavy motor driven frog and switch planing machines, weighing 45,000 pounds each, to the Lorain Steel Company, Johnstown, Pa.

The Hess Machine Works notes a good demand for file making machinery, principally, however, for foreign account. Two sets of file machines have been recently shipped by it for export to France, four sets for export to Switzerland and an order is in hand for four sets for export to England. While the domestic demand for file machinery is weak, there is a fair inquiry for general machinery.

W. E. Shipley, machinery merchant, Philadelphia Bourse, reports a good average business during the week past. Orders for lathes, planers, shapers and general machinery from the various railroad companies have recently been booked, as has also an order from one concern for 15 Reeves variable speed countershafts. Inquiries keep up well and the prospect for future business is considered favorable.

The Murray Iron Works Company, Burlington, Iowa, through its local branch in the Bourse, has recently sold a 300 horse-power Murray Corliss engine for installation at the Wm. Tarbell Hosiery Mill, Riverside, N. J., and a 175 horse-power engine of the same type to the Corbin Lock Company for use at its local establishment, corner Eighth and Arch streets. Business in this territory is reported in good condition by the company; inquiries are numerous and some large propositions are expected to be closed at an early date.

The Alfred Box Company is about ready to ship two 50-ton electric traveling cranes to the New York Central Railroad Company, one for the Port Morris and the other for the Yonkers power station. It will also furnish a 30-ton electric traveling crane, 90-foot span, for the Lardner's Point power station for the city of Philadelphia. Two 10-ton electric traveling cranes, 40-foot span, will also be supplied the power station building by John Wanamaker in this city, while a 30-ton hand power traveling crane is to be furnished the American Steel & Wire Company for its Rankin, Pa., works. The Box Company has also recently equipped two large "airship" machines, built on the order of electric derrick cranes; for use at Coney Island, N. Y., and at Willoughby Grove Park, Philadelphia. The general demand for both cranes and hoists is reported good by the Alfred Box Company, which has a large number of orders on its books.

The Royersford Foundry & Machine Company, Royersford, Pa., advises us that it is extremely busy in the machine shops as well as in the foundry, and the outlook for business is considered very favorable. More punch and shearing machines have been sold by the company since January 1 of this year than in any previous like period, while the foundry trade has largely increased during the past month.

Cleveland Machinery Market.

CLEVELAND, OHIO, June 27, 1905.

Machinery business continues to improve, according to local machinery dealers. There are more inquiries and the volume of business is larger than it was a few weeks back, although, as has been the case all spring, the business is scattered and large orders for a number of tools are comparatively few. As was the case last year at this time, the automobile business promises to furnish a very prolific source of orders for machinery dealers.

There are six large automobile factories in Cleveland and last year nearly all of the companies erected new plants or put up additions. The present season is proving so successful that nearly all the factories are planning for still further extensions, while two concerns are planning for complete new plants. One of them, the White Sewing Machine Company, has already been referred to in these columns as having had plans prepared for an extensive new plant.

The other is the Baker Motor Vehicle Company, a leading manufacturer of electric vehicles. Although its plant is already a large one, the new plant will have three times the present capacity. It will be erected immediately adjoining the plant of the American Ball Bearing Company on the Lake Shore Railroad tracks on the West Side. The cost will be about \$200,000, one-half for buildings and the balance for machinery and equipment. The main building will be 200 x 300 feet and three stories high. It will be L shaped and designed for additions, which will be built later. The

power plant of the American Ball Bearing Company will be enlarged to supply power for the new factory, the addition being 40 x 200 feet, in which a 500 horse-power engine will be installed. In the rear of the main building will be a blacksmith shop, 40 x 100 feet. Particular attention will be paid to making the plant fire proof and a complete automatic sprinkler system will be installed. Considerable new machinery will be installed. The Corlett Engineering Company, Cuyahoga Building, Cleveland, is engineer for the plant.

The Peerless Motor Car Company, which started work on a new plant early this year, will immediately erect additional buildings. There will be a main building, 140 x 210 feet fitted with a gallery, which will be used as an assembling and finishing shop. The present assembling shop will be converted into a machine shop and considerable additional machinery will be purchased. A power plant will be erected, and orders will soon be placed for engine, boilers and generator. The company will introduce a new process of enameling by electricity. The bodies, which are of sheet metal, will be electrified to a considerable degree of heat and the enamel will be sprayed on, the heat causing it to dry quickly.

The Winton Motor Carriage Company is preparing to erect two new buildings, one of them a repository and the other a repair shop. When these are completed the present repair shop will be fitted for a machine and erecting shop. Some new machinery will be purchased.

The Cadillac Automobile Company, Detroit, has sent out inquiries for considerable new machinery and has recently bought a number of new tools from Cleveland concerns.

John P. Cowing, a prominent structural steel and bridge engineer, with offices in the Citizens' Building, this city, will be at the head of a new company which will erect a large plant in Collinwood, near this city. Mr. Cowing has just purchased a large tract of land comprising about 15 acres, and a large warehouse is already under way. Bridges and structural iron work will be produced and a specialty will be made of the Cowing double roller lift bridge, of which Mr. Cowing is the inventor. He is now building a bridge of this type over the Cuyahoga River in Cleveland. The buildings to be erected first will comprise a bridge house 120 x 200 feet, a machine shop 75 x 200 feet, warehouse 40 x 105 feet, a two-story office building and a power house. All machinery will be driven by independent motors, and a great deal of the special machinery is already under construction at the plants of the Wellman-Seaver-Morgan Company, the Brown Hoisting Machinery Company and the Interstate Engineering Company. The power plant will be equipped with gas engines, and an independent gas producing plant using coal as a base will be installed. Pneumatic tools will be used quite extensively. A 75-foot traveling crane will be placed at the receiving ends of the machine and bridge shops, while a 50-foot crane will handle the finished product from the other end. Two switches from the Lake Shore & Michigan Southern Railroad will run into the yard and there will be tracks around the whole plant. Contracts for the buildings are to be placed at once. The name of the company and personnel of the management have not yet been decided upon, but Mr. Cowing will be the active head of the concern.

The Loew Filter & Mfg. Company is making important improvements to its plant. It has recently ordered in the neighborhood of \$25,000 worth of new machine tools, including lathes, planers, presses, drills, &c., and it is making a further addition to its machine shop, which will necessitate more machinery in the near future. Contracts have just been placed for the erection of a foundry building 150 x 300 feet, two stories high, with central skylight. The upper floor will be used for pattern making and wood working machinery will be installed. This foundry will be used to supply heavy and light iron and steel castings of all kinds, which heretofore have been purchased. The present power plant will be enlarged and an additional boiler installed.

The Board of Public Service of Cleveland will shortly advertise for bids on two 2,000,000-gallon pumping engines to be installed in the Fairmount street pumping station. These will be used to supply a 200,000-gallon steel tower to be erected to supply water to the neighboring village of Cleveland Heights. The two 4,000,000-gallon Cornish pumping engines now in the station and which have been in constant use for 52 years have been sold to the Erie Machinery Company, Erie, Pa. They are still in good condition. Two new boilers will shortly be purchased for the Kirtland street pumping station; also new boilers for the Fairmount street station.

The Toledo-Massillon Bridge Company, Toledo, has secured a 14-acre building site on Dorr street, on the Lake Shore and Terminal Belt lines, where it will erect its plant which has been under consideration for some time. The main building will be 100 x 400 feet and there will be several smaller buildings, including blacksmith shop, machine shop and templet shop. The new company is a consolidation of the Toledo Bridge Company and the Massillon Bridge Company, at Massillon, Ohio. The Massillon plant will be retained, for a time at least. The new plant will

be modern in every respect. The company is getting a number of good orders, a contract having just been received for several steel bridges for the Missouri Pacific Railway.

The Vulcan Iron Works Company, which owns a large tract adjoining the tract purchased by the Toledo-Massillon Bridge Company, has announced that it will commence work in the near future on a new plant. The main building will be 200 x 400 feet and there will be in addition a steel and iron foundry, a pattern shop, office building and other structures. The company manufactures steel shovels. The two plants mentioned will form a new manufacturing center near Toledo, and a large number of workmen's homes will be erected nearby.

The Patrick Hirsch Company, Toledo, is placing contracts for the building and equipping of a 42-mile electric line from Toledo to Ann Arbor, Mich. It will shortly place contracts for the power house equipment, which will include among other things two 750 horse-power cross compound condensing engines, two 550-kw. generators, 1500 horse-power jet condensers, four 300 horse-power boilers, a self supporting steel stack, steel frame work for building and 20-ton hand power crane. It will also purchase four substation equipments, seven passenger coaches, two express cars, 70-pound rails for 42 miles, together with machine shop equipment for repair shops; also one large steel bridge and a dozen or more small spans.

The Harris-King Fence Machine Company, recently formed at Ashtabula, Ohio, is erecting a modern machine shop, 65 x 100 feet, for the manufacture of the automatic fence machines designed by Jonathan Harris. The machine mentioned produces an electrically welded tie. Considerable new machinery is to be installed by the company.

The Conneaut Shovel Company, recently formed at Conneaut, Ohio, will erect a new plant in that place for the manufacture of ore shovels, coal shovels, dock shovels, picks and kindred articles. The company will take over two other concerns located elsewhere and will utilize much of their old machinery, but it expects to purchase considerable new equipment.

Government Purchases.

WASHINGTON, D. C., June 27, 1905.

In his report to the Navy Department Commander A. B. Canaga recommends that hereafter turbines be installed in torpedo boats, destroyers, scout cruisers and gunboats.

Chairman Shonts of the Isthmian Canal Commission has decided to place assistant purchasing agents as follows: Alfred H. Anderson at New York, S. E. Redfern at New Orleans, Major Carol A. Devo at San Francisco and F. H. Haraden at Tacoma.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until July 18 for a quantity of supplies for the Pensacola and New Orleans navy yards, including forced draft blowers, &c.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until July 18 for the following supplies for the Portsmouth, Boston, Newport, New York and Washington navy yards: Tool grinders, exhaust system, motors, motor drive outfit, &c.

Turret machines are included in the supplies for the Boston, New York, League Island, Washington and Annapolis naval stations, bids for which will be opened July 11.

The Bureau of Yards and Docks, Navy Department, Washington, has compiled specifications for a coal handling and coal storage plant for building No. 47, at the Pensacola Navy Yard, the estimated cost of which is \$16,000.

The Isthmian Canal Commission will soon purchase two portable concrete mixers mounted on trucks, with operating engine and boiler. The mixers are to be used in connection with paving the streets of Panama.

The Isthmian Canal Commission will soon purchase two straight line air compressors, with a capacity of 1000 cubic feet of air per minute, duplex noncondensing steam cylinders and compound air cylinders, with intercoolers, designed for using steam at 80 pounds pressure and furnishing air at 80 pounds pressure; 12 Imperial pneumatic hammers, 10 pneumatic hammers, 2 long stroke pneumatic riveting hammers, 2 pneumatic piston drills and 2 reversible wood boring machines.

The engineering department of the Canal Zone has requested the Isthmian Canal Commission to purchase three Scotch marine boilers, 6 feet inside diameter and 7 feet long over the tube sheet, with a working pressure of 125 pounds per square inch.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until July 18 for a quantity of supplies for the Mare Island and Puget Sound navy yards, including drills, jacks, motors, &c.

The Isthmian Canal Commission, Washington, will receive bids until July 19 for furnishing pumps and engines for use on the Isthmus of Panama. There will be required two steam pumps and three boilers for the Colon water works, and two double cylinder hoisting engines and boilers for use at Cristobal.

The Isthmian Canal Commission will receive bids until

July 21 for two standard horizontal tubular boilers with flush front and appurtenances.

The Isthmian Canal Commission will soon purchase 10 drills similar to No. 0 Star portable, without walking beam attachment, with a number of tools to go with each machine to drill 5/8-inch holes.

The Department of the Interior, United States Geological Survey, Washington, D. C., will receive bids until August 17 for the construction of about 12 miles of dike, involving the excavation of about 445,000 cubic yards of earth and clearing 125 acres for the reclamation of Yuma Valley, Ariz.

Bids were received at the Bureau of Yards and Docks, Navy Department, on June 10 for a 15-ton electric traveling crane in building No. 37, navy yard, Norfolk, Va., as follows:

Niles-Bement-Pond Company, New York, item 2, \$4685. Morgan Engineering Company, Alliance, Ohio, item 1, \$4895; 2, \$4795.

Manning, Maxwell & Moore, New York, item 2, \$4868.

The Case Mfg. Company, Columbus, Ohio, item 1, \$4875.

Whiting Foundry Equipment Company, Chicago, Ill., item 2, \$4650.

Pawling & Harnischfeger, Milwaukee, Wis., item 2, \$5000.

The following bids were opened June 20 for supplies for the various navy yards:

Bidder 1, American Wood Working Machinery Company, New York; 3, Berlin Machine Works, Beloit, Wis.; 8, Byron Jackson Machine Works, San Francisco, Cal.; 11, Burnham, Williams & Co., Philadelphia, Pa.; 14, Bullard Machine Tool Company, Bridgeport, Conn.; 18, Brown Hoisting Machinery Company, New York; 19, Becker-Brainard Milling Machine Company, Hyde Park, Mass.; 23, Birdsboro Steel Foundry & Machine Company, Birdsboro, Pa.; 24, Brown & Sharpe Mfg. Company, Providence, R. I.; 26, George F. Blake Mfg. Company, New York; 29, Caldwell Bros. Company, Seattle, Wash.; 33, Cleveland Punch & Shear Works Company, Cleveland, Ohio; 36, Curtis & Co. Mfg. Company, St. Louis, Mo.; 40, Cincinnati Punch & Shear Company, Cincinnati, Ohio; 41, Craig Ridgway & Son Company, Coatesville, Pa.; 52, M. J. Davidson, Brooklyn, N. Y.; 53, Drew Machinery Agency, Manchester, N. H.; 54, Detrick & Harvey Machine Company, Baltimore, Md.; 56, George E. Dow Pumping Engine Company, San Francisco, Cal.; 61, Eby Mfg. Company, San Francisco, Cal.; 64, Fox Machine Company, Grand Rapids, Mich.; 71, A. D. Granger Company, New York; 72, Garvin Machine Company, New York; 75, Richard H. Grey, San Francisco, Cal.; 78, General Electric Company, Schenectady, N. Y.; 80, Harron, Rickard & McCone, San Francisco, Cal.; 84, Henshaw, Bulkley Company, San Francisco, Cal.; 86, Hendey Machine Company, Torrington, Conn.; 87, Handlan Buck Mfg. Company, St. Louis, Mo.; 90, Hallidie Machinery Company, Seattle, Wash.; 91, Ingersoll-Sergeant Drill Company, New York; 99, J. B. Kendall, Washington, D. C.; 101, Wm. H. C. Lee, New York; 110, Lima Locomotive & Machine Company, Lima, Ohio; 118, Manhattan Supply Company, New York; 121, Manning, Maxwell & Moore, New York; 133, J. A. Fay & Egan Company, New York; 135, Niles-Bement-Pond Company, New York; 142, Oliver Machinery Company, Grand Rapids, Mich.; 143, George A. Ohl & Co., Incorporated, Newark, N. J.; 145, Pacific Hardware & Steel Company, San Francisco, Cal.; 146, Prentiss Tool & Supply Company, New York; 149, S. M. Price Machinery Company, Norfolk, Va.; 151, H. P. Porter Company, Pittsburgh, Pa.; 153, Pratt & Whitney Company, Hartford, Conn.; 163, Rahn, Mayer, Carpenter Company, Cincinnati, Ohio; 166, Royce & Ricketts, Washington, D. C.; 167, Wm. Sellers & Co., Incorporated, Philadelphia, Pa.; 173, Smith Courtney Company, Richmond, Va.; 174, H. B. Smith Machine Company, Smithville, N. J.; 186, M. B. Tidey, Newark, N. J.; 189, Tatum & Bowen, San Francisco, Cal.; 194, Vandeyck, Churchill Company, New York; 195, Vulcan Iron Works, Wilkes-Barre, Pa.; 202, Henry R. Worthington, New York; 205, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.; 207, Warren Steam Pump Company, New York; 208, S. A. Woods Machine Company, Boston, Mass.; 210, Williams, White & Co., Moline, Ill.; 212, Walter H. Foster Company, New York; 214, Buffalo Forge Company, Buffalo, N. Y.; 215, Erie Foundry Company, Erie, Pa.; 217, Adolph Ferguson, Key West, Fla.

Schedule No. 267.

Class 14. One hand power cornice brake—Bidder 75, \$247.50; 90, \$238.70 and 135; 121, \$236; 143, \$275; 189, \$246.

Class 15. One extra heavy forming machine—Bidder 29, \$209; 75, \$179; 90, \$180.60; 121, \$149.85; 142, \$170; 189, \$184.75.

Class 16. One large and one small burring machine and one crimping machine—Bidder 75, \$52.50; 87, \$44.50; 90, \$44.97; 118, \$49; 121, \$38.85.

Class 17. One combined bench and slitting shears—Bidder 29, \$122; 75, \$149; 87, \$90; 90, \$126; 118, \$134.90; 121, \$104.80; 143, \$69.50.

Class 18. One No. 4 combined punch shear and bar cutter—Bidder 29, \$53.50; 40, \$275; 90, \$99; 121, \$710; 214, \$100.

Class 19. One single bolt cutter—Bidder 29, \$326.92; 53, \$303, \$386 and \$370; 87, \$370; 90, \$329 and \$319; 80, \$346; 121, \$310 and \$311.

Class 20. One upright or post drill, one drilling machine vise and one iron workers' solid jaw swivel vise—Bidder 90, \$64.

Class 21. One three-stage turbine pump—Bidder 8, \$1000; 56, \$910; 101, \$742 and \$1295; 202, \$1160; 214, \$610.

Schedule No. 269.

Class 46. One shaper—Bidder 29, \$265; 90, \$782; 121, \$415 and \$465; 189, \$592.

Class 47. One belt driven turret lathe—Bidder 29, \$3303; 90, \$1659.50; 153, \$2780.

Class 48. One nut facing machine—Bidder 29, \$370; 54, \$374; 90, \$382.80; 121, \$200.

Class 49. One slotting machine, belt driven—Bidder 90, \$690; 121, \$710; 135, \$648.

Class 50. One vertical drill press—Bidder 90, \$1128.15.

Class 51. One pipe threading machine, with nipple attachment—Bidder 29, \$90; 53, \$783, \$627 and \$649; 87, \$550; 90, \$465; 80, \$525; 121, \$575.

Class 52. Two double dry motor driven emery grinders—Bidder 29, \$699; 87, \$600; 90, \$835.09; 80, \$704.

Class 53. One automatic knife grinder, motor driven—Bidder 3, \$396; 87, \$385; 90, \$528 and \$389.40; 189, \$468; 208, \$650.

Class 54. One band sawing machine, motor driven—Bidder 29, \$504; 61, \$333; 90, \$415; 80, \$350; 174, \$380; 189, \$385.

Class 55. Two automatic self feeding circular rip saw tables, with motor—Bidder 3, \$1150; 29, \$1600; 61, \$1176; 90, \$1539; 189, \$1164.

Class 56. One two-spindle upright molding machine, with motor—Bidder 29, \$634; 90, \$695 and \$422.10; 174, \$532; 208, \$800.

Class 57. One hand planer, with motor—Bidder 29, \$593; 61, \$409; 90, \$482.40; 80, \$485; 174, \$450.

Class 58. One dimension planer, with motor—Bidder 3, \$1675; 29, \$2290; 90, \$1999 and \$1729.

Class 59. One four-roll single surfacer, motor driven—Bidder 3, \$760; 29, \$1000; 61, \$699; 90, \$800; 189, \$1060.

Class 60. One single cylinder hydraulic keel plate bender—Bidder 135, \$7899; 210, \$6150.

Class 61. One beveling machine, with motor—Bidder 90, \$3094.

Class 62. One heavy double punch and shears, with motor—Bidder 33, \$4865; 40, \$5675; 90, \$6950; 121, \$5000; 135, \$5590 and \$6260; 210, \$6300.

Class 63. One plate planing machine, with motor—Bidder 33, \$5485; 135, \$4400 and \$5975; 167, \$4200.

Class 64. Valve reseating outfit, milling machine vise, blacksmiths' heating forge, blacksmiths' anvils, coopers' hand punch, coopers' hand shearing machine and grindstones—Bidder 90, \$530.16; 80, \$126, part; 214, \$45, part.

Class 65. One improved hand jointer, with motor—Bidder 3, \$405; 61, \$327; 84, \$309; 80, \$375; 174, \$366; 189, \$343.

Class 66. One band saw, with motor—Bidder 61, \$337; 84, \$390, \$400 and \$420; 80, \$425 and \$325; 174, \$355; 189, \$398.

Class 67. One three-drum sanding machine, with motor—Bidder 3, \$1875; 84, \$2330; 80, \$1650; 174, \$1821; 189, \$2019.

Class 68. One single drive flat turret lathe—Bidder 84, \$1665; 153, \$2795.

Class 69. One motor driven hand jointer—Bidder 3, \$512; 61, \$456; 84, \$465; 80, \$425; 174, \$450; 189, \$446.

Schedule No. 272.

Class 108. Two rotary converters and accessories—Bidder 78, \$19,872; 205, \$22,076, \$20,870 and \$24,356.

Class 109. One locomotive—Bidder 11, \$5525; 110, \$4680; 151, \$5445; 195, \$5200.

Schedule No. 273.

Class 111. One special air hydraulic balanced jib foundry crane—Bidder 18, \$1225; 36, \$1050, \$1000, \$650, \$700 and \$950; 41, \$1100; 91, \$475; 121, \$475.

Class 112. One No. 3 horizontal boring and drilling machine, with 5 horse-power motor—Bidder 121, \$2210; 135, \$2490; 146, \$2420.

Class 113. One vertical drilling machine, electrically driven—Bidder 135, \$330; 146, \$380.

Class 114. One vertical drilling, boring and turning mill, belt driven—Bidder 14, \$1475; 121, \$1470; 135, \$1495; 146, \$1465; 194, \$1450; 217, \$210.

Class 115. One single spindle vertical sensitive drilling machine, belt driven—Bidder 153, \$92.75.

Class 116. One motor driven vertical boring and drilling machine—Bidder 121, \$250; 135, \$333.

Class 117. One motor driven vertical drilling and boring machine—Bidder 135, \$730.

Class 118. One four-spindle multiple drilling machine—Bidder 121, \$2850; 135, \$2590; 173, \$3285.

Class 119. One style Worcester twist drill grinder—Bidder 121, \$190.

Class 120. One universal disk grinder, belt driven—Bidder 87, \$284 and \$344; 121, \$315; 194, \$275.

Class 121. One wet twist drill grinding machine, belt driven—Bidder 121, \$155.

Class 122. Three special drop apron water tool grinders—Bidder 121, \$825.

Class 123. One speed lathe—Bidder 121, \$140.

Class 124. One electrically driven wood lathe—Bidder 133, \$711; 142, \$1165.

Class 125. One No. 3 combination variety wood turning lathe—No bids.

Class 126. One belt driven engine lathe—Bidder 72, \$335; 86, \$395; 121, \$595; 153, \$403.

Class 127. One back geared belt driven engine lathe—Bidder 72, \$790; 86, \$875 and \$857; 121, \$875; 135, 782; 146, \$859; 163, \$749.40; 212, \$690 and \$790.

Class 128. One 36-inch triple geared engine lathe, belt driven—Bidder 72, \$1485; 121, \$1950; 135, \$1510; 146, \$1715; 166, \$1750; 212, \$1500.

Class 129. One tool makers' engine lathe complete—Bidder 86, \$565; 121, \$560; 153, \$637.

Class 130. One combination chasing and turning bench lathe—Bidder 153, \$920.

Class 131. One flat turret lathe—Bidder 99, \$348.75; 121, \$1230; 153, \$1456.

Class 132. One No. 0 plain milling machine—Bidder 19, \$595; 24, \$512; 99, \$413; 135, \$525.

Class 133. One universal milling machine—Bidder 19, \$900; 24, \$980; 86, \$965; 121, \$960; 135, \$945; 146, \$990.

Class 134. One dimension planer—Bidder 3, \$1100; 133, \$1740; 208, \$1400.

Class 135. One high speed planer, with direct connected motor—Bidder 121, \$1260; 135, \$1360 and \$1658; 149, \$1560; 173, \$1350; 145, \$1610.

Class 136. One hand planer and joiner complete, electrically driven—Bidder 99, \$552.90; 133, \$528; 142, \$698.

Class 137. One 30-inch upright drill press—Bidder 121, \$530; 173, \$559.95.

Class 138. One pipe threading and cutting machine—Bidder 53, \$890 and \$1159; 121, \$1100; 135, \$1250 and \$965; 166, \$560 and 750; 212, \$940.

Class 139. One cold saw mounted on a turntable—Bidder 23, \$2129.58; 87, \$1725; 135, \$1795; 195, \$1685.

Class 140. One power hack saw complete—Bidder 87, \$43; 121, \$20.

Class 141. One hand sawing machine, electrically driven—Bidder 133, \$605; 142, \$665.

Class 142. One No. 1 scroll saw, electrically driven—Bidder 1, \$235; 133, \$282; 142, \$240.

Class 143. One new pattern combination saw and dado machine—Bidder 1, \$357.86; 99, \$220; 133, \$597; 186, \$485.50.

Class 144. One cutting off sawing machine—Bidder 133, \$454; 186, \$598.

Class 145. One automatic saw sharpener—Bidder 121, \$245.

Class 146. One universal double arbor tilting table saw bench—Bidder 121, \$480; 133, \$506; 142, \$660.

Class 147. One double punching and shearing machine—Bidder 23, \$2176; 33, \$2310; 40, \$2500; 121, \$2775; 135, \$2390; 146, \$2820; 166, \$1980.

Class 148. Two-foot power squaring shears—Bidder 87, \$300; 121, \$224.

Class 149. One No. 3 bar shear—Bidder 33, \$927; 121, \$756; 135, \$750.

Class 150. One 18-inch crank shaper—Bidder 86, \$400 and \$650; 135, \$625; 146, \$585.

Class 151. One motor driven shaper—Bidder 86, \$920; 121, \$910 and \$920; 135, \$860; 146, \$878.

Class 152. One motor driven shaper—Bidder 86, \$920; 121, \$910 and \$920; 135, \$860; 146, \$918.

Class 153. One cutting off machine, electrically driven—Bidder 153, \$950.

Class 154. One electric motor drive outfit for bending rolls—Bidder 135, \$910.

Class 155. One electric drive outfit for bending machine—Bidder 135, \$575.

Class 156. One automatic plug machine—Bidder 208, \$975.

Class 157. One bolt pointing machine, belt driven—Bidder 53, \$207 and \$218; 54, \$208; 87, \$206; 121, \$195.

Class 158. One oil separator—Bidder 121, \$65.

Class 159. One double disk sanding machine—Bidder 121, \$135; 142, \$365.

Class 160. One automatic band saw, six No. 0 wood trimmers and three No. 5 wood trimmers—Bidder 64, \$535.90; 142, \$577.

Class 161. Two No. 0 and two No. 5 wood trimmers—Bidder 64, \$290.30; 142, \$315.

Class 162. One stove pipe crimper and one stove pipe former—Bidder 87, \$34.

Class 163. Two grindstones and frames—Bidder 121, \$130; 133, \$116.

Class 164. One combined air and circulating pump—Bidder 26, \$390 and \$355; 52, \$600; 71, \$494; 207, \$380.

Class 165. Two self contained jig sawing machines—Bidder 133, \$448.

Class 166. One 25-inch crank slotting machine, electrically driven—Bidder 121, \$4100; 135, \$4800; 166, \$4130.

Class 167. One ship plate hole beveling machine—Bidder 33, \$456; 135, \$565.

Schedule No. 274.

Class 171. One motor driven single punch machine, including automatic stop, motor 5 horse-power—Bidder 33, \$1210; 40, \$1100; 121, \$1375; 135, \$1097; 146, \$1600; 166, \$1166; 215, \$1558.

Metal Market.

NEW YORK, June 28, 1905.

Pig Tin.—The gradual advance in price which has been going on since the first of the month has been continued during the week and, like the preceding weeks, the advance has been on a small volume of business. On Thursday, Friday and Monday business was very dull and there were no sales of any moment at the ruling quotations of 30.55c. to 30.65c. On Tuesday a fair business was done at about 30.70c. At this quotation the New York market is about on a parity with London quotations and yesterday a small premium was paid for spot delivery, as Tin from the steamship Mesaba was sold at lower quotations. This Tin will be in store either late this afternoon or to-morrow morning. In London business is nearly as quiet as it is here, and London operators seem to be of the opinion that in spite of the high prices, which are restricting trade, and the commencement of the dull season, when the Tin Plate mills will be shut down, American consumers will need all the metal that has been shipped or is under way, and with that feeling in view the London market advances whenever the American interests start buying. To-day's quotations on the local Metal Exchange are 30.60c. to 30.75c. for spot, 30.45c. to 30.75c. for July and 30.40c. to 30.62½c. for August. In London prices have advanced to £140 for spot and £137 17s. 6d. for futures. The arrivals so far this month amount to 2545 tons and 2158 tons are afloat.

Copper.—A very firm undertone prevails in all branches of the Copper trade, and, while there are no especially large lots recorded as sold during the week, still a number of sales of small quantities made a considerable amount. Some holders of the metal are not disposed to sell any Lake Copper for immediate shipment unless a premium is paid and are reluctant to make contracts for August delivery on a 15c. basis. Both Lake and Electrolytic are quoted at 15c., but the market is very well sold up to August, and a number of sales for delivery further into the third quarter have been noticed. Casting Grades are held at 14.75c., with a fair amount of business. The exports continue fair, but the total for this month will hardly reach the large amount of last month, as there have been but 17,467 tons so far exported, of which 2600 tons go to Chinese melters. There is some talk of the Chinese sounding this market further for shipments to that country, but as yet no further sales have been recorded. In London more interest has been taken in the Copper market, and prices have advanced slightly to £66 2s. 6d. for spot, and £66 for future, with Best Selected at £70 15s. From reports furnished by the New York Metal Exchange, the imports of Copper into France for the five months ending May 31 amount to 19,126 tons, as against 25,371 tons in the corresponding period last year and 18,176 tons in 1903.

Pig Lead.—There is an excellent trade going on in Lead and the market is very strong. Prices have advanced to 4.55c. to 4.60c., but the American Smelting & Refining Company continues to quote 4.50c. for shipment Lead in 50-ton lots. In St. Louis the price is also slightly higher at from 4.45c. to 4.47½c., and the same condition prevails in London, where Soft Spanish Lead is quoted at £13 6s. 3d., an advance of 6s. 3d.

Spelter.—Business is very quiet and, although quotations are slightly lower at 5.30c., shrewd buyers are able to obtain shipments from the West at considerable concessions from these figures, as the quotation from St. Louis is nominal at 5.07½c. In London the price is unchanged at £24. Zinc Ore remains on a firm basis, despite the importation of Ore from British Columbia and Mexico. The present shipments, however, are not large enough to make any appreciable difference in the Ore market.

Antimony.—The advance continues, London having advanced £5 during the week. In New York Hallett's and Cookson's are held at 11.50c. to 12.50c. and other grades at 11c. to 12c.

Quicksilver.—A fair demand exists, and the price remains unchanged at \$38 per flask of 75 lbs. in 100-flask lots.

Rothschild's price in London is £7 7s. 6d., and second hands make the same quotations.

Nickel.—The market is practically unchanged, and a fair demand exists at the ruling quotation of 40c. to 45c. per lb. in large lots.

Tin Plates.—The Plate mills are closing down for their annual inventory, and this has tended to curtail the offerings of jobbers at concessions from the forward prices. Quotations are unchanged to-day at \$3.74 a box for 100-lb. 1C Coke Plates and \$3.55 in Pittsburgh. In Swansea the quotation is unchanged at 11 shillings 4½ pence, but it is worthy of notice that the stock of Tin Plates held there on June 10 was 237,026 boxes, as against 118,794 boxes at the same time last year.

New York.

NEW YORK, June 28, 1905.

Pig Iron.—Only a few sales of moderate quantities have taken place in this district, the largest being a lot of 1000 tons. In New England a number of makers of textile machinery have bought and one valve maker is in the market. Prices in this district are irregular and some low offers are reported. We quote for Northern Irons at tidewater \$16.50 to \$17 for No. 1 Foundry, \$15.75 to \$16.50 for No. 2 Foundry and \$15.25 to \$15.50 for No. 2 Plain. Southern Iron is selling on the basis of \$15.25 to \$15.50 for No. 2 Foundry.

Cast Iron Pipe.—Manufacturers report a continuance of quiet conditions. Small lots are the general rule, and these are not particularly numerous at present. The long expected contract for the Brooklyn high pressure service is now quite confidently expected to come on the market, as proposals have been invited for the necessary machinery. This means that the pipe contract will not be long deferred. Carload lots are quoted at \$27 per net ton for 6-inch at tidewater.

Finished Iron and Steel.—The pressure for Structural Material is asserted to be greater at this time than ever known, even in the most active periods of the Iron trade. The largest mills are so crowded with work that they will not promise deliveries earlier than four or five months. Premiums are being asked by Eastern mills on work which must be had earlier. The great activity is due more to the very extensive building operations now being conducted all over the country than to bridge work. In this immediate locality quite a number of buildings are now being figured on, and contracts will shortly be placed. Negotiations are also on foot for structures in Baltimore, Washington, and quite a number of cities in New England. The Plate trade is fair, with the mills still reported well supplied with work. The demand is excellent for Iron and Steel Bars. A meeting of the Eastern Bar Iron Association was held in this city last Thursday, which reaffirmed the price of 1.50c., f.o.b. Pittsburgh. It was also decided to hold the regular monthly meetings hereafter on the third Wednesday in every month. Quotations at tidewater are as follows: Beams, Channels, Angles and Zees, 1.74½c. to 1.84½c.; Tees, 1.79½c. to 1.89½c.; Bulbs, Angles and Deck Beams, 1.84½c. to 1.94½c.; Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine, 1.94½c. to 2.04½c.; Fire Box, 1.94½c. to 2.50c., according to specifications; Refined Bar Iron, 1.59½c. to 1.64½c.; Soft Steel Bars, 1.54½c. to 1.64½c.

Old Material.—Quite a number of rolling mills are now closing for repairs, and the demand for rolling mill stock will therefore be very light for some time. Quite a number of consumers would like to purchase for August and September delivery on the basis of present prices or perhaps slightly lower, but so far dealers have not been inclined to close contracts of this character. Inquiries have improved for Cast and Steel Scrap, and in these lines it would appear as if consumers were about to come into the market. Among the inquiries of the week was one for 500 tons of Old Car Wheels. Prices per gross ton, New York and vicinity, are approximately as follows:

Old Iron Rails.....	\$16.50 to \$17.50
Old Steel Rails, rerolling lengths.....	13.25 to 14.25
Old Steel Rails, short pieces.....	13.00 to 14.00
Relaying Rails.....	20.00 to 21.00
Old Car Wheels.....	15.00 to 16.00
Old Iron Car Axles.....	18.00 to 19.00
Old Steel Car Axles.....	16.00 to 17.00
Heavy Melting Steel Scrap.....	13.00 to 14.00
No. 1 Railroad Wrought Scrap.....	15.00 to 16.00
No. 1 Yard Wrought Scrap.....	13.50 to 14.50
Iron Track Scrap.....	13.00 to 14.00
Wrought Pipe.....	11.00 to 12.00
Ordinary Light Iron.....	7.50 to 8.50
Cast Borings.....	6.50 to 7.50
Wrought Turnings.....	10.00 to 11.00
No. 1 Machinery Cast.....	13.50 to 14.50
Stove Plate.....	11.00 to 12.00

The New England Iron League has elected Harry O. Russ of the Phoenix Bridge Company, Boston, secretary, to fill the vacancy caused by the death of Frank A. Wilson.

PERSONAL.

John Birkinbine, consulting engineer and president of the Franklin Institute, Philadelphia, has been appointed one of the members of the Water Supply Commission of Pennsylvania under an act passed at the last session of the Legislature empowering the Governor to appoint this commission, which will have general supervision over the streams of the State, acting in conjunction with the Forestry Commissioner and the Commissioner of Health.

E. M. Miller, who recently resigned as manager of the Bignall & Keeler Mfg. Company, Edwardsville, Ill., is succeeded by B. T. Delafeld of St. Louis. Mr. Miller will devote his time to the management of a foundry at Granite City in which he is interested.

James A. Burden, president of the Burden Iron Company, Troy, N. Y., sails for Europe this week and will spend some time in France.

Edward Ball, who for several years has had charge of the iron mines of the Tennessee Coal, Iron & Railroad Company, has been appointed general manager of mines and quarries, the position having been created recently, and carrying with it some of the duties heretofore performed by President Bacon.

A movement is on foot to appoint Dr. Robert Grimshaw, now a resident of Hanover, Germany, as a technical expert adviser to the American consulates in Germany. Dr. Grimshaw was for many years prominently connected with technical journalism in this country.

Leonard Peckitt, president of the Empire Steel & Iron Company of Catasauqua, Pa., sails for Europe on the Campania for a brief pleasure tour.

Clarence R. Darrow, who recently resigned as president and general manager of the Mahoning Foundry & Machine Company, Youngstown, Ohio, has accepted a position with the sales department of the William B. Pollock Company, builder of heavy steel plate work, blast furnace and rolling mill construction.

H. C. Frick will sail for Europe July 11.

A. E. Maccoun, superintendent of the electrical department of the Edgar Thomson Steel Works and blast furnaces of the Carnegie Steel Company, has been appointed superintendent of the 11 Edgar Thomson furnaces, to succeed Herman A. Brasser, who resigned last week. Isaac Hoffman, who has been connected with the Edgar Thomson furnaces for 28 years, will be assistant to Mr. Maccoun, who has already assumed his new duties.

The Largest Steel Contract Ever Made.

PITTSBURGH, PA., June 28, 1905.—(By Telegraph.)—We are officially advised by Wallace H. Rowe, president of the Pittsburgh Steel Company, Frick Building, Pittsburgh, that negotiations have just been closed by which his company, which operates large rod, wire, wire nail and fencing works at Monessen and hoop and cotton tie mills at Glassport, Pa., will purchase its entire requirements of Bessemer and open hearth billets from the United States Steel Corporation for a long term of years, commencing July 1. The Pittsburgh Steel Company has the distinction of being the largest independent consumer of steel billets in the country and has made some very large contracts for billets in past years with the Republic Iron & Steel Company and the Carnegie Steel Company. The business of the company is constantly growing and some time ago plans were taken up actively for the building of a number of blast furnaces and Talbot open hearth furnaces at Monessen in order to make the company independent of the outside steel market. These plans for the building of blast furnaces and steel works were well under way when negotiations were opened between the United States Steel Corporation and the Pittsburgh Steel Company for its supply of steel for a long period, and these negotiations have just been successfully closed. The Carnegie Steel Company has low rates of freight from its Clairton Steel Works and Duquesne Steel Works

into Monessen and can ship billets into the plant there at a very low freight cost.

The Pittsburgh Steel Company is a consumer of billets to the extent of 200,000 tons a year, and as the contract just closed is to run for a long period of years it will amount to 1,000,000 tons and probably more. Nothing regarding the prices to be paid for this immense tonnage of billets has been made public, but it is understood the contract is on a sliding scale basis, being so much per ton for billets above the average price of Bessemer pig iron each month. The contract is an extremely good one for the Pittsburgh Steel Company, insuring to the company its entire supply of billets for a long period at very favorable prices. In view of the contract just made the company will abandon its plans for the building of blast furnaces and steel works at Monessen, at least during the life of the contract. It is also an advantageous contract for the United States Steel Corporation, as it gives it an outlet for about 200,000 tons of steel per annum. It is by far the largest single contract for steel ever made. The making of this contract indicates strongly that there is no probability of the Pittsburgh Steel Company selling out its works or becoming identified with any outside combination, such as has been reported in the daily press recently. The company will not dispose of its works, but will be an independent producer of wire, rods, wire nails, Pittsburgh Perfect fencing, steel bands, hoops and cotton ties in the future, as it has been in the past.

Important Railroad Transaction.

PITTSBURGH, PA., June 28, 1905.—(By Telegraph.)—The United States Steel Corporation has just purchased the entire stock of the Lake Erie & Pittsburgh Railroad, which has been building large terminal docks at Lorain, Ohio, for some months. The road is to connect the manufacturing plants at Lorain, Niles, Youngstown, Hubbard, New Castle and Sharon, and connection will probably be made with one of the trunk lines at Sharon, giving the Lake Erie & Pittsburgh Railroad a direct line into Pittsburgh. It is possible, however, that the road will build its own line into Pittsburgh and have its own direct connections with the Homestead Steel Works, Edgar Thomson Steel Works, Duquesne Steel Works and all the other manufacturing plants of the Steel Corporation in the Pittsburgh district.

This is one of the largest railroad deals made in the Pittsburgh district for a long time and will be of immense advantage to the Steel Corporation. The first work was started at Lorain, where a large sum of money was spent on dock terminals, which when completed will be among the best equipped on the lakes. The grading of the new road was then taken up and will be completed as far as Youngstown, Ohio, within a short time. The work of laying the tracks has been started on the western division. It was the intention of the company to build a \$2,000,000 terminal at Youngstown, and plans had been completed for this project, when it was discovered that another company was arranging for the building of a belt railroad around the city. The old plans were then dropped and new ones adopted for the construction of a road around the city and changing the terminal to Lowellville, Ohio. In this manner the company will be able to reach every plant of the Steel Corporation in the Youngstown district without handling any of the freight over leased lines. Orders have been issued to start the work of building the terminal at Lowellville. Several branch lines will be built to points in Ohio and Pennsylvania to reach the plants operated by the subsidiary concerns of the corporation.

The railroad demurrage act which the New York, New Haven & Hartford Railroad has tried to get through the Connecticut Legislature, reducing the period before demurrage charges begin to 48 hours, has been put over to the next Assembly—that is, for two years. The manufacturers of the State have opposed the change.

HARDWARE.

THE matter of jobbers' special brands promises to be an increasingly interesting topic with the trade in all its branches. Prior to the recent convention at Hot Springs the Manufacturers' Association had given very careful consideration to it, and as a result of repeated conferences a set of resolutions was adopted declaring in clear and unmistakable language the manufacturers' view of special brands as so injurious to their interests as well as those of the trade and the public as to require some earnest and energetic action. These resolutions were formally replied to by the Southern Hardware Jobbers' Association in an able and ingenious rejoinder. Since that time the manufacturers, it is understood, have not been idle, but have been devoting consideration to the practical measures to be adopted to carry out their policy and secure in some way the marketing far more generally than has recently been the case of their own trademarked goods. That the jobbers are not disposed to let the grass grow under their feet is indicated in the aggressive way in which the matter was taken up at the convention last week of the retail Hardware merchants of Arkansas, as reported in the following pages. The popular advertising of their own brands by a leading Hardware house is another illustration of the determination and aggressiveness of the jobbers in this direction. There is little doubt that all this is only the beginning, and that the jobbers are preparing to carry on a very earnest campaign in opposition to the policy of the manufacturers.

This action on the part of the jobbers is not a surprise to those familiar with the situation and the trade. While not nearly so vital to the jobbers as to the manufacturers the question is for them a serious one, and it is not to be wondered at that they are determined to defend their business interests. It is evident, however, from the vigor with which they are taking up the subject and the manner in which they are appealing to the retail trade that the manufacturers will have to bestir themselves and evince a like, if not superior, energy in maintaining their position and educating the trade and the public. They have a good cause and should push it resolutely and persistently, and should not be outdone by the jobbers in the care and detail of their presentation of the matter to the retail merchants of the country.

The influence of popular or national feeling in connection with the marketing of goods abroad is illustrated at the present time in movements more or less pronounced which are militating against American export business. The resentment on the part of the Chinese on account of their treatment by this country is resulting in a boycott which is already of sufficient significance to affect commercial interests, while the possibility that it may progress indefinitely makes it matter for grave consideration by the Government at Washington and by all interested in our East Asian trade.

There are also indications that in Great Britain there is developing a disposition to give English goods the preference not only over the French and, especially, the German, which are regarded with decided aversion, but also over the American. This influence in several lines is said by representative manufacturers to be an obstacle which must be recognized in cultivating the English home market.

Advices just received from Australia are to similar effect, indicating that the same spirit is operative there, as there is a perceptible and decided inclination on the part of the trade and the public to purchase home made goods, the regret being that there are so few of them. American goods, however, seem to continue to be regarded with favor in these colonies, and thus far there has been no interruption of importance to their introduction and sale.

The most extreme and fantastic manifestation of this spirit is, however, furnished by the Province of Quebec in the enactment of a law relating to the sale of goods in that province by the representatives of non-resident manufacturers. This law is indeed so framed that while it is probably intended to prohibit the usual activities of a commercial traveler unless a \$300 license has been procured it is susceptible of the interpretation that it also forbids the sale of goods by sending samples, catalogues or price-lists, or even by advertising them. This might be termed restrictive legislation gone mad, but it illustrates the principle under consideration, inasmuch as this astonishing law was the result of a natural and indeed laudable desire on the part of Canada to foster home manufactures and to become industrially independent. These instances and tendencies come at this time as reminders that in the commercial battle for the world's trade local and national feelings and ambitions will have to be reckoned with.

Condition of Trade.

A let-up in the active prosecution of business at this season is quite in the usual course, and at the present time is not so pronounced as to indicate anything unfavorable in regard to the outlook. The six months now closing have been on the whole characterized by excellent conditions, although some of the more sanguine anticipations which prevailed at the opening of the year were not realized to their full extent. In heavy goods there has been some vacillating in the matter of price, and the volume of business in this line has been somewhat affected by these influences, but Hardware in general has been quite steady. Manufacturers have had no reason for reducing prices so far as the cost of their goods is concerned, this being practically unchanged, the tendency being, indeed, with the natural increase in the expense account, toward higher rather than lower costs. Prices certainly have been, on the whole, very well maintained. With excellent prospects for the crops, and in view of the prosperous conditions generally prevalent, the outlook for the remainder of the year is regarded as decidedly encouraging.

Chicago.

Hardware business in general shows a comfortable improvement over the week previous, due to more seasonable weather on an average, though the weather has been unusually cold for the end of June. Japanned Registers have been advanced, the established price to retailers being now 70 and 10 instead of 75 per cent. discount from list. Seasonable goods are moving well, and there is some improvement in the booking of business for fall delivery. Word has been passed along among Hardware jobbers that it will be wise for them to cover on their Black and Galvanized Sheet requirements and on goods made from Sheets and Tin Plate, the inference being that prices on these lines will be strengthened before long. They are still weak, however, and are relatively low as compared with other lines of iron and steel. It is pretty certain that the Amalgamated Association,

which has made demands for large advances in the wage scale, will not recede from its stand without a fight, and unless the mills give in there is before the Sheet trade the possibility of a prolonged fight and a tie-up of such mills as are unable to secure nonunion labor. If, on the other hand, the employers accede to the demands the cost of manufacture will be materially increased, necessitating higher selling prices. A tie-up of mills for a month would not be at all unwelcome to the trade, as it will give tone to the market by leading to the consumption of overstocks which are in hands of jobbers and consumers. Rather less than the usual amount of price cutting and rumors of price cutting is in evidence on Nails and Wire goods. A meeting of Wire manufacturers, held in Chicago June 21, considered plans for firmly holding the present prices. Just what was done in furtherance of the programme of the month previous for curtailing output is not in evidence, but it is generally known that many of the Wire plants will be closed during the month of July.

NOTES ON PRICES.

Wire Nails.—A meeting of a number of the manufacturers of Wire and Wire Products was held at Chicago June 21, at which time it was decided to reduce production during the summer months and also to maintain the official schedule of prices. The leading interest has made a practice of reducing its output of Nails and Wire during these months, and the following of the same plan by the other mills will tend to prevent an undue accumulation of Nails and thus do much to insure a more even market. Stocks of Nails purchased at \$1.75, base, and lower, and Wire at the corresponding prices, which have been sold at less than the regular prices of manufacturers, are fast disappearing from jobbers' hands. Orders received for the foregoing goods at regular quotations during the past two weeks indicate a firmer market and that buyers do not, as a rule, expect to obtain concessions from regular quotations. There is an increased volume of business being booked by the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers.....\$1.80
Carloads to retailers.....1.85

New York.—Demand in the local market keeps up in good volume. The market remains firm and prices are unchanged, as follows: Single carloads, \$1.99; small lots from store, \$2.05.

Chicago.—A meeting of Wire manufacturers was held June 21 at the Grand Pacific Hotel, Chicago, practically all the outside mills of the country being represented. The meeting was executive, and the only announcement of its proceedings was that prices were reaffirmed and that a stronger tone prevailed than during the month previous. The mills generally will close down for all or part of July for their necessary overhauling and repairs. How long this shutdown will be delayed beyond absolute requirements will depend upon market conditions. It is stated by the leading producer that business booked for midsummer shipment is unusually heavy on Nails as well as on Wire. Quotations are on the basis of \$1.95 in car lots to jobbers, \$2 in car lots to retailers, with 5 cents advance for less than car lots from mill.

Pittsburgh.—There is no noticeable change in conditions of the Wire Nail trade. Jobbers report that stocks are moving out more freely, and this is shown by the fact that the mills are entering more orders than for some time. The larger mills advise us they are maintaining official prices, but some of the smaller mills and a few jobbers who still have large stocks are cutting prices to some extent to get orders. This is always a dull season of the year in the Wire Nail trade and the present quiet demand is therefore not exceptional. We quote Wire Nails at \$1.80 in carloads to jobbers and \$1.85 to single carload buyers, actual freight from Pittsburgh to destination being added, but in some cases these prices are shaded.

Cut Nails.—The Cut Nail Association will not hold its customary meeting this month, the date having been put over until some time in July. Production is, as far

as possible, in proportion to demand, which is moderate. Quotations are as follows: Carload lots, \$1.80; less than carload lots to jobbers, \$1.85, and to retailers, \$1.95, f.o.b. Pittsburgh. Iron Cut Nails, for delivery at Pittsburgh, Buffalo and all points west of these cities, 10 cents advance per keg on Cut Steel Nails. These quotations are shaded quite frequently.

New York.—The market is unchanged, with a fair demand. New York quotations are as follows: Carloads on dock, \$1.94; less than carloads on dock, \$1.99; small lots from store, \$2.

Chicago.—Except for Iron Shingling Nails and Cut Floor Brads the demand for Cut Nails is light compared with Wire Nails, and prices are not as firmly maintained. A better tone prevails, however, and \$1.90 to \$1.95 is the prevailing quotation for car lots to either consumers or merchants, with \$2 asked for reasonably large lots less than car lots. Store prices range from \$2 to \$2.10, according to size of order.

Pittsburgh.—There is only a fair amount of new business in Cut Nails and the output of the mills is being regulated as far as possible to meet actual demands. We quote Cut Nails at \$1.70 to \$1.75, base, in carload lots, f.o.b. maker's mill, the lower price being absolute minimum of the market. For Iron Cut Nails an advance of 5 to 10 cents a keg is charged over above prices.

Barb Wire.—Demand on the mills is light, while jobbers' stocks are being distributed to retail merchants. This is a season when Barb Wire is not very active. Quotations are unchanged, as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$1.95	\$2.25
Retailers, carload lots.....	2.00	2.30
Retailers, less than carload lots.....	2.10	2.40

Chicago.—Jobbers are still active in a move to reduce stock by making concessions of about \$1 a ton. Official prices are as follows: Painted Wire, \$2.10; Galvanized, \$2.40; car lots to retailers, 5 cents higher; less than car lots, Painted Wire, \$2.25; Galvanized, \$2.55; Staples, Bright, in car lots to jobbers, \$2.05; Galvanized, \$2.35; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—While stocks held by jobbers are moving out quite freely, they are still large enough to meet existing demands of the smaller trade, and the mills, therefore, are receiving only a fair amount of new tonnage. This is between seasons in the Wire trade, when a quiet demand is usually expected. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$1.95	\$2.25
Retailers, carload lots.....	2.00	2.30
Retailers, less than carload lots.....	2.10	2.40

Smooth Fence Wire.—Only a moderate demand is being enjoyed by mills in the way of new business. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....\$1.65
Retailers, carloads.....1.70

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized...\$0.30	.35	.40	.45	.55	.65	1.05	1.15		

Chicago.—Official prices are unchanged, and there is a good undercurrent of strength in the market which bids fair to tide it over the interim between seasons and to guarantee strength at the opening of the buying season when it comes a little later. Official prices are as follows, on the basis of \$1.80 for Annealed, car lots to jobbers, and \$1.85 in car lots to retailers, with 5 cents advance for less than car lots and 30 cents premium over Annealed for Galvanized.

Pittsburgh.—A moderate amount of new tonnage is being placed and the larger mills are endeavoring to hold prices firmly, but some of the jobbers are making slight concessions in order to make stocks move out more freely. In a general way the market is fairly strong. We quote

as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.65
Retailers, carloads.....	1.70

Paris Green.—On June 26 manufacturers advanced the 5-ton price of Paris Green 2 cents per pound, the extras for smaller quantities remaining unchanged. Warmer days have brought some inquiries from buyers, but the average weather has not been conducive to the development of potato bugs. Quotations for 5 tons or over are as follows:

Arsenic, kegs	14 c.
Kegs, 100 to 175 pounds.....	14½c.
Kits, 14, 28 and 56 pounds.....	15½c.
Boxes, 2 and 5 pounds.....	15½c.
Boxes, 1 pound.....	16 c.
Boxes, ½ pound.....	17 c.
Boxes, ¼ pound.....	18 c.

The following extras are charged for smaller quantities:

5000 to 10,000 pounds.....	1 c.
1000 to 5000 pounds.....	1 c.
500 to 1000 pounds.....	1½c.
Less than 500 pounds.....	2 c.

Bolts and Nuts.—Manufacturers of Carriage and Machine Bolts, &c., also of Nuts, held a meeting last week, at which time it was decided to make no changes in the prices of any of these goods. Business was reported as being somewhat quiet, but not exceptionally so for the season. A good trade is anticipated, and it is expected that demand will be of sufficient volume to maintain prices, which are, however, characterized by moderate irregularities.

Registers.—Under date of June 15 manufacturers of Registers made an advance in the price of japanned, electroplated and bronzed goods. The advanced price on the foregoing Registers is represented by the discount of from 70 to 70 and 10 per cent. No change was made in the price of Solid Brass and Bronze Registers.

Building Paper.—The market for building papers, both in Tarred Roofings and other kinds, shows a demand fairly good, although prices are lower than they were previous to the termination of territorial prices last winter, when the combination lost control of the situation. Prices now are approximately the same all over the country, being fixed by competition instead of by agreements or arbitrary arrangement. The following rates reflect present prices: Single Ply Tarred Roofing Felt is from \$26 to \$30 per ton, location and quality accounting for the range of price; Two Ply is quoted 40 to 50 cents per roll and Three Ply 60 to 70 cents per roll; Rosin Sized Sheathing ranges from \$28 to \$32 per ton and Deadening Felt at \$40 to \$42 per ton. These prices include deliveries in territory adjacent to manufacturing points.

Forbes Chocolate Company.—Among other articles made by the Forbes Chocolate Company, Cleveland, Ohio, which are of interest to our readers are the following, which we give with prices on larger and smaller quantities:

	Per dozen.	Per gross.
Triumph Fruit Jar Holder.....	\$1.20	\$12.00
T. & B. Fruit Jar Wrench.....	.75	6.00
Triumph Syrup and Oil Can Wrenches, cop- pered, for 1. 1½ and 1½ inch screw caps	.30	2.50
Vim Tin Shear and Can Opener.....	.75	7.50
Parrot Tack and Stub Puller.....	.75	6.00
Tarbox Pillow Sham Holder.....	4.00	36.00
Modern Window and Floor Cleaner combina- tion tool.....	9.00	72.00
	Each.	Per dozen.
Glasbrite No. 2, 5-pound can (powder)....	1.25	12.00
Glasbrite No. 2, 10-pound can (cake).....	2.50	24.00
Vim Stove Pipe Shear.....	1.00	9.00
Tuttle Roller Press Mop Pall Wringer.....	8.00	48.00

Prices on full lines of the above goods and on other products of the company are given in its price-list and discount sheet.

Rope.—The market is a quiet one as far as business is concerned, and lack of demand coupled with comparatively low fiber values has caused some inequalities in prices. These are most noticeable in the various grades of Manila and in No. 2 quality of Sisal Rope. The following quotations are sometimes shaded from ¼ to ½ cent per pound on these goods, according to buyers and sellers.

General quotations, on the basis of 7-16-inch diameter and larger, are as follows: Pure Manila, 11½ to 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 to 8¼ cents per pound.

Burgon & Ball's Sheep Shears.—Wiebusch & Hilger, 9-15 Murray street, New York, have been appointed exclusive selling agents for the United States for the line of Sheep Shears made by Burgon & Ball, Sheffield, England. In the prices of these goods there has for some time been a good deal of demoralization, making them somewhat unsatisfactory to handle. Wiebusch & Hilger, however, being now in control of the situation, are expecting to put this business on such a basis that the goods will yield a margin of profit to both jobber and retailer.

Window Glass.—Factories are going out of blast each week, the producing capacity thus being materially reduced. The present indications are that no factories with the exception of the machine plants will be in operation during the summer months. Local jobbers report a continued light demand. New York quotations are 90 and 10 per cent. discount on all sizes, single and double, with the exception of the first two brackets of single strength B, which are 90 and 20 per cent. discount. The exception is made to meet the price of machine made Glass.

Putty.—Owing to competition among Putty manufacturers, which became prominent last fall, prices have been so low that a number of manufacturers have practically been driven out of business. At a meeting of Putty manufacturers who it is claimed manufacture 90 per cent. of the total production in the United States an agreement was reached to maintain an advance in prices. Published quotations on commercial Putty represent an advance of 5 cents per 100 pounds and are as follows:

	Per 100 pounds.
In barrels and tubs.....	\$1.10 to \$1.15
In bladders.....	1.75 to 1.80
In 12½, 25 and 50 pound tins.....	1.45 to 1.60
In 1, 2, 3 and 5 pound tins.....	2.05 to 2.95

Oils.—*Linseed Oil.*—The market is very quiet, demand being confined to small lots. The market is firm, without change in prices. Quotations are as follows: City Raw, 50 to 51 cents per gallon, and State and Western Raw, 48 to 49 cents, both according to quantity.

Spirits Turpentine.—The local market is only fairly active, demand being restricted to small lots. Southern advices are to the effect that the market is steady. New York quotations, according to quantity, are as follows: Oil barrels, 62½ to 63 cents; machine made barrels, 63 to 63½ cents per gallon.

THE NATIONAL HARDWARE MUTUAL FIRE INSURANCE COMPANY.

W. P. BOGARDUS, president of the National Retail Hardware Association and vice-president of the National Mutual Fire Insurance Company, has recently addressed a circular letter to the members of State Hardware associations, in which attention is called to the subject of Hardware mutual insurance and the close connection existing between the National Company and the National Association. Mr. Bogardus points out that the National Company was organized for the purpose of affording the privilege of mutual insurance to association members in States where there is no local Hardware insurance company, and in other States to carry surplus insurance above the line the local company can carry. It is further stated that the company has now passed its organization period and that the payment of dividends began April 1, the dividend for the even year ending at that time being 28 per cent. Inasmuch as the company's business is well scattered and carefully selected more substantial dividends are looked for in the future.

THE LAWSON MFG. COMPANY, 40 Dearborn street, Chicago, has been appointed Western agent for the output of the Chantrell Tool Company, Reading, Pa.

SOUTH CAROLINA MERCHANTS ORGANIZE.

At a meeting held at Wright's Hotel in Columbia, S. C., on the 14th and 15th inst. the South Carolina Retail Hardware Association was organized. The meeting was a very successful one, considering the novelty and limitations of the organization movement in the South and the difficulty of persuading competitors that their interests are to be conserved by the same means and that it pays better for fellow merchants to work in harmony than to try to do it all by cutting prices below the line that marks a legitimate profit.

Merchants Present.

The following merchants were present at the meeting:

T. A. Schumpert, Newberry Hardware Company, Newberry.
Jno. B. Brooks, Brooks & Jones, Laurens.
W. S. Stewart, Columbia.
J. W. Smoak, Orangeburg.
W. H. Jones, Abbeville Hardware Company, Abbeville.
M. O. Dantzler, Orangeburg.
J. H. Burns, Burns & Barrett, Sumter.
E. C. Burch, Hartsville Supply Company, Hartsville.
A. R. Craig, Horry Hardware Company, McColl.
A. W. Welling, Marion Hardware Company, Marion.
T. O. Flowers, Rock Hill Supply Company, Rock Hill.
W. H. Smith, Smith Hardware Company, Gaffney.
Paul W. McLure, Gambrell Hardware Company, Greenwood.
N. A. Craig, Greenwood Hardware Company, Greenwood.
E. O. Rodgers, Florence Hardware Company, Florence.
J. L. Williams, Timmons Hardware Company, Timmons.
M. Bonnoitt, Welling & Bonnoitt, Darlington.
H. P. Duvall, Cheraw Hardware & Supply Company, Cheraw.
P. M. Parrott, Durant Hardware Company, Sumter.
G. A. Baxter, Arthur Hardware Company, St. Matthews.

At the request of the assembled merchants Paul W. McLure of the Gambrell Hardware Company, Greenwood, announced the purpose of the meeting as the formation of an association for the protection and advancement of retail Hardware interests in every legitimate way, the classifying of those who sold Hardware as a side line only as "leaders," opposition to catalogue houses and their parcels post agitation, and the adoption of the mutual fire insurance feature.

M. L. Corey, secretary of the National Retail Hardware Association, was then introduced and asked to give his views on the benefits and advantages to be derived



H. P. DUVAL.

from organization, which he did in a clear and concise manner.

H. P. Duvall of Cheraw was elected temporary chairman of the meeting and Mr. McLure was chosen temporary secretary.

The following committees were then appointed by the chair:

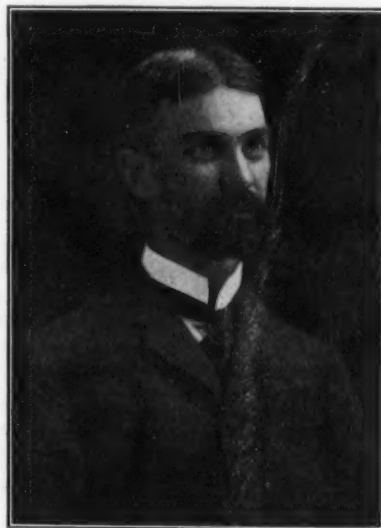
CONSTITUTION AND BY-LAWS: M. Bonnoitt, W. H. Smith, A. R. Craig.

FINANCE: J. H. Burns, T. O. Flowers, E. O. Rodgers, G. A. Baxter.

NOMINATIONS: T. A. Schumpert, A. W. Welling, P. M. Parrott.

ORGANIZATION: Jno. B. Brooks, J. W. Smoak, E. C. Burch, N. A. Craig.

Mr. Duvall was subsequently elected president and Mr. McLure secretary and treasurer. A motion to make application for membership in the National Association was carried. After a resolution of thanks to the management of the hotel for courteous treatment the newly



PAUL W. McLURE.

formed association adjourned to meet again in Columbia on the second Tuesday in June next year.

DEATH OF ANDREW LUCAS HUNT.

ANDREW LUCAS HUNT, second son of Edwin Hunt, Chicago's pioneer Hardware merchant, died at his home in that city June 23. Mr. Hunt was born in New York March 19, 1843, and went to Chicago in 1854, and some years later entered employment in his father's store on Lake street, which had been established in 1847. At the outbreak of the Civil War he went to the front with Ellsworth's Zouaves and later became First Lieutenant of the 134th Illinois Volunteers. At the close of the war Lieutenant Hunt re-entered his father's store and in 1868 was admitted into partnership. The original firm name had been changed to Edwin Hunt & Son when, in 1863, Edwin Hamilton Hunt, the eldest son, was admitted to partnership, and this was changed to Edwin Hunt & Sons when the young lieutenant became a partner. Subsequently William Hunt, the youngest son, became a partner, and on the death of their father the firm name was changed to Edwin Hunt's Sons. The two remaining brothers and other stockholders in the company expect to continue the business and to enlarge its scope, though no definite decision has yet been reached. The decedent left a widow and a young son. He was a deacon and trustee of the Church of the Covenant and a member of the G. A. R. and Loyal Legion.

TEXAS ASSOCIATION'S MANUAL.

THE RETAIL DEALERS' HARDWARE AND IMPLEMENT ASSOCIATION OF TEXAS has recently issued what is styled an "official manual and directory," containing more than 80 pages of matter, which ought to be of interest and value to the merchants of the State who are alive to the necessity of correcting evils and abuses connected with the trade. The manual contains the association's constitution and by-laws, proceedings of the last annual convention, a full roster of members, matter on the reciprocal underwriters' plan of insurance adopted by the association, a history of the association and "other information of interest to the legitimate Hardware, Implement and Vehicle trade of the State of Texas." J. W. McManus of Waxahachie is the efficient secretary of this association.

M. Y. Cliff & Co. have opened up in the general Hardware business at Ingram, Wis.

H. MUELLER MFG. COMPANY'S EASTERN DIVISION.

AFTER several months' careful preparation the H. Mueller Mfg. Company, Decatur, Ill., has formally opened its Eastern Division at 254-258 Canal street, corner of Elm, New York City. Invitations are extended to all friends of the company, especially those in the Water, Gas and Plumbing trade, to visit and inspect its commodious and sumptuous new quarters. The company has installed here the handsome exhibit which it had at the St. Louis Exposition and has fitted up the interior of the office in an expensive manner to match the antique furniture and beveled plate glass showcases used at the Fair. These, with rich hangings and tasteful mirror furnishings, go to make up a most attractive and luxurious office suite. The building has a frontage of 61 feet on Canal street and a depth of 63 feet. The space occupied includes the ground floor and basement, the latter extending under the sidewalk so as to make a total available space of 10,000 square feet. There are entrances both on Canal and Elm streets, with exceptional facilities for ventilation and light. In the matter of business accessories the office is supplied with messenger service, a private telephone plant, commodious filing apparatus, and, in fact, all devices that will facilitate the handling of business expeditiously and with least labor. In the showroom are displayed samples of goods which are carried in stock, including water main Tapping machines, Pressure Regulators, Brass Water Connections, Lead Goose Necks, Curb and Corporation Stop Cocks, Service Boxes, Service Clamps, Strainers and Pipe Line Tools for water works use; gas main Tapping Machines, Gas Cocks, Gas Meter Connections and Gas Relief Valves for use in gas plants, and hundreds of samples of Ground Key, compression and Fuller work and Tools for plumbers' use. Oscar Mueller, treasurer, and youngest of the six sons comprising the firm, is resident manager of the new branch house. His education as an engineer and his business experience admirably qualify him for this responsible position. His assistant is Tom F. Leary, for many years the representative of the company in the Central West.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM W. V. KNIGHT, Hardware merchant handling Stoves, Implements, Paints and Sporting Goods at Westbrook, Maine. Mr. Knight has recently bought out the stock of A. T. Skillings.

FROM HANSON & CANFIELD, who have opened a retail Hardware, Stove and Sporting Goods store at Woodbine, Iowa.

FROM ROSS, DYE & COWGILL, who have succeeded Ross Bros. in the Shelf and Heavy Hardware, Stove, Sporting Goods and Wind Mill business at Central City, Neb.

FROM SIDMAN BROS., Fargo, N. D., who have bought the stock of the Fargo Hardware Company from B. J. Rowland and will conduct a wholesale and retail business in Shelf and Heavy Hardware, Stoves and Tinware.

THE HARRISON SUPPLY COMPANY, Boston, Mass., dealer in Chilled Steel Shot and Granite and Marble Polishers' Supplies, has been incorporated in Massachusetts as the Harrison Supply Company, Incorporated. The officers are: President, G. E. Harrison; treasurer and general manager, Nathan C. Harrison; vice-president, Rupert A. Fairbairn.

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Wood Shovel & Tool Company's Plant.

SECOND ARTICLE.

The Steam and Power Plant,

situated in the south end, consists of a Babcock & Wilcox water tube boiler and a Cooper-Corliss engine. In the boiler room are also located duplex pumps to handle the fuel

for driving the machines, as well as for the incandescent and inclosed arc lights throughout the entire plant. The machine shop is fully equipped with new and modern machines, lathes, planers, shapers, drill presses, power hack saw, emery lathes, &c.

The forge room, 62 x 129 feet, is also equipped with machines of the latest styles known in Shovel making, including a number made from the company's own designs, doing work formerly accomplished by hand. In this room, the only one containing fires, every precaution

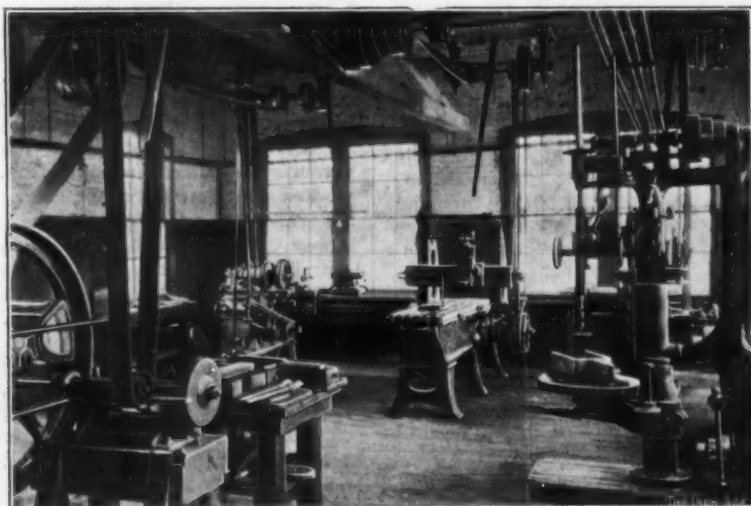


Fig. 5.—Machine Shop.

oil and a Stilwell-Bierce compressor to force fuel oil through a small tank to the furnaces, likewise supplying air to blow off the scale and turnings from the presses and forming dies. Fuel oil is received in tank cars and unloaded by gravity into an iron storage tank of 8000 gallons capacity placed about 50 feet east of the main building, in a pit below the floor line of the factory. The oil is drawn from this storage tank by duplex pumps to another iron tank holding two days' run, which, like the

has been taken to guard against conflagration. The overhead timbers are covered with steel and painted. The only exposed wood is the sheathing and this is covered with three coats of Asbestine fire proof paint. All water, air and oil pipes are brought to the different machines in conduits under the cement floor. The conduits and openings are covered with a cast iron grating. The furnaces, of the company's own construction and designs, are made with cast legs and frames and lined with fire



Fig. 6.—Forge Room.

main tank, is below the floor grade. This gives the pipe lines a gravity drawing out side in case of fire or accident. The pipe line is controlled by an automatic safety valve, with lines of safety pulls distributed through the forge room, which, in case of accident, can be tripped by employees at different points.

The machine shop adjoins the forge room, separated by fire wall and fire door, and is equipped with a gas engine for use in this department, it being independent of the rest of the plant and designed to furnish power

brick. Over each of these are iron hoods extending over all sides and fronts and connected with a large galvanized piping system, which is attached to two 60-inch Sturtevant fans located under the cone of the roof, with the exhaust pipe carried above the highest point of the roof. These fans are run at high speed for ventilation and carrying off the heat from the furnaces.

Steel stock from cars enters this department at the south end, over scales, on its way to the steel tracks, where it is kept under the card system, or to the trimming

presses. After being cut down it passes from one machine to another on its way through the factory on trucks without loss of time or needless traveling over the same territory.

The pickling room, convenient and adjoining the forge room on the north, is made as near water and acid proof as possible. The floors are cement and drain to the center, where sewage connection is made. The division walls on two sides are cement, the others rock plaster, with a base 4 feet high sheathed with steel plates.

The polishing room adjoins the pickling room on the west and is very complete, occupying some 60 feet along the west side of the building. The polishing lathes stand over a pit 6 feet wide and 60 feet long. This is arched over with a concrete floor. The pit contains the shaft for underneath driving of the lathes, also to drive a 60-inch Sturtevant exhaust fan. The lathes are hooded with galvanized hoods and these are connected with the fan by a system of piping to carry off all dust and dirt from the lathes to a pit east of the factory.

The glue or wheel room, next to the pickling room, is fitted with racks for finishing wheels. Stationary iron glue pots, heated by steam, emery and flint trays, com-

room goods are loaded on drays for less than carload lots, and from the east door for car lots.

Adjoining the shipping room on the west are the offices, a supply storeroom, toilet rooms and a hallway. Through this hallway all employees enter the factory, registering in and out on a Dey time registering clock.

The company has two large offices, fitted with many modern appliances to expedite business; also local and long distance telephones, fire and signal alarms and watchman's time detector, with magneto stations in each department and at the extreme ends of the factory. The watchman's system is connected with a clock inside the vault. There is likewise a large brick and cement fire proof vault and toilet room. A signal alarm system also connects the office and each department with an alarm whistle attached to the boiler, by means of which and a system or code of alarms the engineer is notified in case of fire, accidents, &c.

The plant is heated throughout with exhaust steam. In the main rooms, with an overhead piping system, each department is connected with Reliance steam traps to return the hot water.

While the company is making all lines of Shovels,

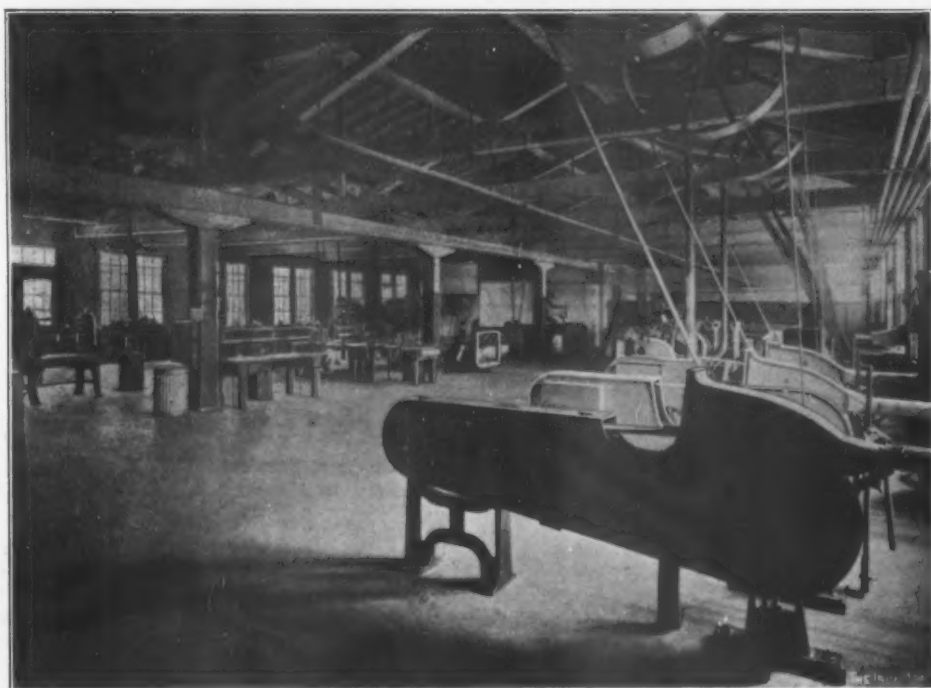


Fig. 7.—Polishing and Handling Room.

plete the equipment of this room. It is heated by means of the overhead system, and the temperature is kept at even heat to dry the buffing wheels, belts, &c.

The dry kiln adjoins the glue room. The sides, roof and floor are made of concrete and it is heated with exhaust steam. It is utilized to withdraw from seasoned handles the moisture that may remain from the steaming and bending process.

The handling room is 62 x 103 feet, occupying the full width of the building. It contains a number of improved machines for boring, riveting and handling the Shovels. All wheeling and boring machines, as well as the sanding wheels and belts, are incased with specially designed galvanized hoods and covers which are connected with pipes to an exhaust fan located under the cone of the roof. The fan collects all dust, shavings and borings from the machines and carries them to a pit east of factory.

The labeling and tying room adjoins the finishing room on the west and north corner. Here the Shovels are cleaned off and dipped in a lacquer to protect the blades and straps from rust. Neat and attractive labels are placed on the strap and D of the handle, and the Shovels are then tied in bundles for shipment. From here they enter the shipping room, which is at the extreme north end of the factory. From the front of this

it is making a particular effort on what is called the Wood special railroad and contractors' Shovel; also Wood special molders' Shovel. These goods are of special design and of the highest grade. The company has been in business a little over two years. Within the first year the factory, which was of frame construction, was burned to the ground. The present factory was completed in December, 1903, and the first shipment made from it in February, 1904.

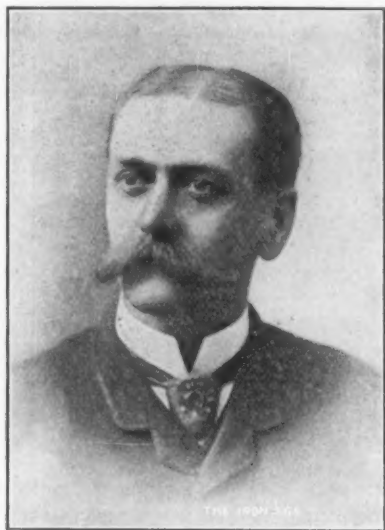
(To be continued.)

CUTLER HARDWARE COMPANY, Waterloo, Iowa, which recently increased its paid-up capital to \$100,000, has purchased the business of the Norris & Loring Hardware Company, Cedar Rapids, Iowa, and the stock and fixtures thus acquired are being removed to Waterloo. The Cedar Rapids company has been in business about 15 years, during the last three of which an exclusively wholesale trade has been carried on. C. M. Loring, a member of the absorbed house, has bought an interest in the Cutler Company and will ally himself actively with it. Two of the Norris & Loring salesmen will be added to the Cutler force, making nine traveling representatives in all. Mr. Norris, president of the company which has thus gone out of business, will devote himself to manufacturing interests.

NEW ENGLAND IRON AND HARDWARE ASSOCIATION.

THE annual meeting of the New England Iron and Hardware Association was held at Newton, Mass., Tuesday, June 20. Through the courtesy of George P. Bullard the privileges of the Newton Club were extended to the association and their guests and a large number availed themselves of the opportunity. Dinner was served at 6.30 p.m., after which the annual election of officers and directors was held and reports of officers and chairmen of committees were received. The latter showed that the association is in a flourishing condition and is preparing to make further advances under the new commissioner, George J. Mulhall. Special efforts are to be made to extend the use of the credit and collection department.

A number of amendments to the by-laws were made, including increasing the number of directors from 9 to 11 and empowering the old board to select the two new members; making the clerk and treasurer eligible for membership in the board, and making a quorum of the board consist of five instead of four, as heretofore. Samuel A. Bigelow, chairman of the Nominating Committee, presented the following for directors, who were unanimously elected: J. T. Boyd, C. H. Breck, C. F. Bragg, C. F. Dowse, H. L. Doten, William Chamberlain, Oscar A. Shepard, William P. Hill and Roswell M. Boutwell. The directors then retired and elected Charles F. Bragg, president; William P. Hill, vice-president; John T. Boyd, clerk, and Charles H. Breck, treasurer. Mr. Bragg having served the association very acceptably was accorded the unusual honor of re-election. Souvenirs in the form of leather card cases were distributed, and the meeting,



CHARLES F. BRAGG.

which was one of the most successful ever held, was brought to a close with an address by Hon. John W. Weeks, Congressman from the Twelfth District of Massachusetts.

DEATH OF DE WITT C. BRADLEY.

DE WITT C. BRADLEY, senior member of the firm of G. W. Bradley's Sons, Westport and Weston, Conn., manufacturers of Cutlery and Axes, died June 17, aged 59 years. He was born in Weston, and learned a trade in the Axe and Cutlery factory of his father. After a period of service in the United States cavalry in the West he returned to Weston, and has since maintained his connection with the firm, for 20 years being the senior partner. He was prominent in Connecticut, having represented his town in the Legislature for four years, and in 1901 being elected to the State Senate. He held various town offices during his life.

DEATH OF HERMAN C. MECHLING.

HERMAN C. MECHLING, manager of the New York branch of the Wheeling Corrugating Company, was one of the unfortunate passengers killed in the wreck of the Twentieth Century Limited at Mentor, Ohio, last week. He had been connected with the company since its inception 15 years ago and had been prominently



HERMAN C. MECHLING.

identified with the iron business in New York for 20 years.

Mr. Mechling was born in Meadville, Pa., in 1855. His boyhood was spent in Pittsburgh and while still young he began his business education in the iron trade. He moved to Brooklyn in 1887, where he has since resided. The ties once formed by Mr. Mechling among those with whom he was brought in contact, either in a business or social way, remained unbroken. His generous impulses and wide sympathies endeared him to all who knew him. His home life is said by those conversant with it to have been ideal. He was the companion of his two children, Harry E., 24, and Helen, 16, and the devoted helpmate of the widow, Mrs. Helen R. Mechling, all of whom survive him.

Mr. Mechling was a member of the Crescent Club, Brooklyn; the Fulton Club, New York; Commonwealth Lodge, F. and A. M.; the Pennsylvania Society, Royal Arcanum, and until recently was a member of the Montauk Club, Brooklyn. The funeral services were held Monday last from his home at Ninety-seventh street and Shore road, Brooklyn. The pall bearers, who are well known in the trade, were John Sprague, P. R. Jennings, Jacob Meurer, Eugene Munsell, C. H. Bolles, Alexander Glass, W. H. Daycock, N. S. Whitaker, Clifton Wharton and W. H. Abbott. Mr. Mechling's death to many, in this city especially, is a personal loss, and numerous tributes to his memory have been paid by the large circle of friends who were drawn to him by his high mental and moral qualities.

F. E. KOHLER & Co., Canton, Ohio, have recently enlarged their space and otherwise improved their equipment for the manufacture of Shovels so as to be in a position to produce goods of requisite quality and in quantities to cover the requirements of their growing trade. They are now giving attention to their fall stocks of Furnace Scoops and Snow Shovels, on which, with their increased facilities, they expect to be able to make prompt shipments. This firm, with whose line of Hardware Specialties the trade are familiar, has been in business at its present stand since 1879 without a change of partners.

TAX ON COMMERCIAL TRAVELERS IN CANADA.

THE recent enactment of a law in the Province of Quebec, effective May 20, 1905, providing for the collection of a license fee of \$300 a year from all manufacturers not resident in the province, which includes the important cities of Montreal and Quebec, is causing much confusion and not a little solicitude on the part of those to whom it applies. There are, however, some indications that the unreasonable and obnoxious statute will not be enforced and that it will probably be repealed at the next session of the Legislature. It is, however, a drastic enactment entailing very severe penalties.

This statute is known as "Assembly bill No. 17, an act to amend the law respecting licenses and taxes upon commercial corporations." Its substance, so far as commercial travelers are concerned, is given in the extracts which follow. Prominent lawyers are said to have expressed the opinion that the act is unconstitutional, and partly on this account and partly because the sentiment of the commercial classes is practically unanimous in opposition to the bill, a well informed and thoroughly responsible member of a prominent wholesale house in the province has stated to some American manufacturers that the obnoxious measure will not be enforced in the interval preceding the next assemblage of the Legislature, and advised against taking out such license by foreign manufacturers doing business in that province. It is further said that the law makes it obligatory on even Canadian manufacturers located outside of Quebec Province to take out such license. The prediction is therefore made by well informed parties that the law will be repealed when the next Legislature meets. One representative of a leading manufacturing concern in the United States states that he was not molested in the city of Quebec but that the law was being enforced elsewhere, while from other sources the opinion is expressed that the law will be practically a dead letter. On one phase of the question, however, there seems to be much unanimity in the Canadian business world among merchants—namely, that the law is to be condemned as an unwise trade restriction, reviving as it does a discredited form of legislative embargo opposed to modern methods of trade development. The following excerpts from the recent enactments amending the license laws previously in force give the legal status of the matter:

1. Article 229 of the Quebec License law, 63 Victoria, Chapter 12, is amended by adding the following clause:

"7. If a person not residing in the Province, to act as a commercial traveler by soliciting or taking orders for, or selling goods, wares or merchandise, other than intoxicating liquors, or by advertising or offering such goods for sale, by sample, catalogue or price-list, for a person, firm or corporation having no place of business in Canada."

2. The following section and articles are added after article 341d of the said act:

SECTION VIIIC.

NONRESIDENT COMMERCIAL TRAVELERS REPRESENTING PERSONS, ETC., HAVING NO PLACE OF BUSINESS IN CANADA.

"341e. Any person not residing in the Province who is desirous of acting as a commercial traveler, by soliciting or taking orders for or selling goods, wares and merchandise, other than intoxicating liquors, or by advertising or offering such goods for sale by sample, catalogue or price-list, for a person, firm or corporation having no place of business in Canada, shall first obtain a license therefor from the collector of provincial revenue for the district in which he begins his operations in the Province.

"Such license is subject to article 9 of this act, granted for one year, and expires on the first day of the month of May subsequent to its issue.

"341f. Every person not residing in the Province who acts as a commercial traveler by soliciting or taking orders for, or selling goods, wares or merchandise, other than intoxicating liquors, or by advertising or offering such goods for sale, by sample, catalogue or price-list, for a person, firm or corporation having no place of business in Canada, without being the holder of a license for that purpose, then in force, is liable to a fine of not more than one thousand dollars, and not less than five hundred dollars for each contravention.

"341g. Every such person shall show his license to any collector of provincial revenue or to any person authorized in writing by a collector of provincial revenue, and in default of so doing such person shall be held to have no license and is punishable accordingly.

"341h. No commercial traveler licensed as aforesaid shall lend his license to another under a penalty of three hundred dollars for each offence."

3. Article 342 of the said act is amended by adding thereto the following:

X.—NONRESIDENT COMMERCIAL TRAVELERS REPRESENTING PERSONS, ETC., HAVING NO PLACE OF BUSINESS IN CANADA.

"For each license for a person not residing in the Province to act as a commercial traveler by soliciting or taking orders for, or selling goods, wares or merchandise, other than intoxicating liquors, or by advertising or offering such goods for sale, by sample, catalogue or price-list, for a person, firm or corporation having no place of business in Canada, three hundred dollars."

AN ADVERTISEMENT OF GARDEN HOSE.

WE are indebted to a correspondent for a copy of an advertisement appealing for the local business in Garden Hose. At first thought this might seem to be rather an unsuggestive line and difficult to feature, but the writer ingeniously solves the problem by approaching it from the inside. Here is his presentation of this seasonable article:

"BUYING A PIG IN A POKE."

There is great difficulty confronting one who buys anything where all sides of his purchase cannot be seen. This applies in this instance to Garden Hose. Now, the inside of a Hose is hidden and one cannot see it. Therefore a buyer has to take the word of a dealer that there's rubber in that particular Hose. Our Garden Hose is reliable, for we have taken great pains to get only good stock. You can safely use our Hose, knowing it will give good service. Pure rubber and cotton grades from 8½¢. per foot up to 12¢. If asked, we can furnish Hose Menders, Lawn Sprinklers and Sprayers. All we need is to be asked.

In regard to this advertisement our correspondent says: "It is really surprising how attractive an old 'saw' or saying is in advertising. People will stop reading local news to glance at and through such a piece of 'copy.' Those who paid for the above, for instance, profited by it. There are a good many links in the chain of success, and a good bit of welding is needed. Perhaps the above will show how to generate a certain kind of business welding heat."

TRADE ITEMS.

THE EBBING MFG. COMPANY, INCORPORATED, St. Louis, Mo., succeeds G. A. Milbradt & Co. in the manufacture of Rolling Step Ladders. The new owner has transferred the manufactory from 1922 North Broadway to 1336-1342 North Eighth street, where the manufacturing capacity is described as being 50 per cent. greater than that of the old plant. The Milbradt Ladder is widely and favorably known, and the new owner of the business expresses itself as highly pleased with the trade it is receiving.

THEODORE R. BRISTOL, receiver of the Phelps & Bartholomew Company, Ansonia, Conn., manufacturer of Clocks, states that the business may be sold or may be reorganized, in which latter case it will remain in Ansonia and will be run on the same lines as formerly. The company was organized some 15 years ago with a capital stock of \$15,000, all held by Andrew H. Bartholomew with the exception of two shares.

YALE & TOWNE MFG. COMPANY, 9-15 Murray street, New York, made a fine display of its Blount Coach and Station Door Checks, Locks and Hardware, together with the Triplex, Duplex and Differential Chain Blocks, at the conventions of the American Railway Master Me-

chanics' Association and Master Car Builders' Association recently held at Manhattan Beach. The company also had a similar exhibit at the American Railway Appliance Exhibition in Washington, D. C. Both exhibits attracted favorable attention, the latter being the subject of two illustrated leaflets recently issued.

In recognition of the provision for their convenience and comfort made by A. E. Bolles, manager of *Hardware*, New York City, in securing a special train to and from the recent convention at Hot Springs, his fellow travelers have presented Mr. Bolles with a handsome sterling sil-

ver compote. The gift bears the following inscription: "Presented to A. E. Bolles by his fellow travelers on the 'Hardware Special' to the fifteenth annual convention of the Southern Hardware Jobbers' Association, Hot Springs, Va., June 6 to 9, 1905."

COLDWELL LAWN MOWER COMPANY, Newburgh, N. Y., advises us that the company's mowers have received the highest award at the Botanical Show recently held in Regent Park, London, England. E. C. Ross, manager of the London office of the company, looked after the details of the exhibit.

Arkansas Retail Hardware Association.

THE sixth annual convention of the Arkansas Retail Hardware Association was held in Little Rock on the 21st, 22d and 23d insts., Gleason's Hotel being the scene of the gathering. The attendance was the largest and the meeting the best in the history of the organization.

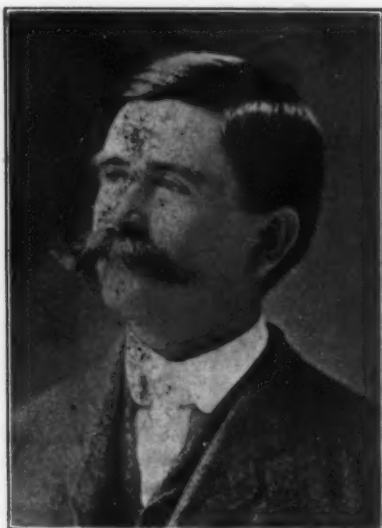
The convention was called to order on Wednesday morning by President Hamp Williams, after which prayer was offered by Rev. John T. Christian. An eloquent address of welcome to the city was then delivered by the Hon. De E. Bradshaw of Little Rock, to which an appropriate response on behalf of the association was made

will hereafter be known as the Arkansas Retail Hardware Association.

Freight Rates.

"The Matter of Freight Rates" was the subject of a very interesting address by A. R. Bragg, manager of the Merchants' Freight Bureau of Little Rock. Mr. Bragg strongly indorsed proposed legislation giving more power to the Interstate Commerce Commission in the matter of freight rate regulation. At the conclusion of Mr. Bragg's address, Secretary Taylor spoke as follows:

I desire to say here that my idea in asking Mr. Bragg to read this paper was to bring out some of the points



HAMP WILLIAMS.



C. E. TAYLOR.

by Thomas B. Stewart of Newport. W. A. Jackson of Dardanelle followed with a report as chairman of the Programme Committee, after which R. P. Allen of Van Buren read the Executive Committee report. The remainder of the morning session was taken up with announcements on behalf of the traveling men and of the retail and wholesale Hardware merchants of Little Rock, general remarks made by members and visiting manufacturers, jobbers and travelers and the appointment by the president of convention committees on Resolutions, Press, Finance, Auditing and Nominations.

Conspicuous among those who made addresses were J. D. Warren of Benedict, Warren & Davidson Company, Memphis, Tenn., vice-president of the Southern Hardware Jobbers' Association; W. P. Bogardus, Mount Vernon, Ohio, president of the National Retail Hardware Association, and S. Norvell of the Norvell-Shapleigh Hardware Company, St. Louis.

114 Members.

The report of the Committee on Membership showed that 37 members had been taken into the association since the last convention, making the present strength of the organization 114 firms.

"Dealers" Dropped.

On motion the name of the association was altered, the word "Dealers" being omitted. The organization

which he has so clearly and forcibly given us. There is no more important part of our business than watching the matter of freight charges, and I dare say that if your freight bills for the past year, as paid by you, were carefully checked up by an expert you would be astonished at the amount of overcharges which you have paid from time to time without knowing that you have been overcharged. The concern with which I am connected is a member of the Little Rock Merchants' Freight Bureau, and I cannot express too strongly the conviction that it has filled a long felt want in our community. Mr. Bragg is pre-eminently the man for the place, being so well qualified through his years of experience in the railroad business. And I am pleased to state that in the two and a half years' connection we have had with the bureau he has saved us a good deal of money; certainly for more than the amount which we have paid to the bureau in dues. I have watched the matter carefully, and I can say here to-day that the railroads have not been able to turn him down in any contention that he has ever made relative to a rate—they don't know how. I believe the convention should pass a resolution indorsing Mr. Bragg's work and the position taken by him in his address.

J. J. Mandlebaum of the Fones Brothers Hardware Company told of the organization of the Little Rock Merchants' Freight Bureau, which, he said, had been the means of saving the shippers of the city many thousands of dollars. Not one claim against the railroad company made by Manager Bragg for the merchants, he said, had

been turned down. Mr. Mandlebaum recommended the organization of similar freight bureaus in the different cities and larger towns of the State.

Following Mr. Mandlebaum, J. M. McClure, vice-president of the Phillips & Buttorff Mfg. Company, Nashville, Tenn., was recognized, and said:

In line with the remarks just made by Mr. Mandlebaum, I desire to say that our concern several years ago hired a competent freight man to look after the freight matters handled through our office. We call him our freight traffic manager, and I can state without reservation that he has saved our company more than the amount of his salary each month since he has been giving these matters his entire attention. If you retailers cannot for any reason belong to a nearby freight bureau you should certainly give the matter of freight rates some of your careful attention. You will find that it pays.

A motion was then made and carried that a resolution be prepared for adoption by the association indorsing the views of Mr. Bragg as set forth in his address.

Mr. Bogardus' Address.

W. P. Bogardus of Mount Vernon, Ohio, president of the National Retail Hardware Association, addressed the meeting on the work of the national body. Mr. Bogardus' presence at the convention was very much appreciated by the members and his interesting and able address was listened to with close attention.

Mutual Insurance.

The report of the Committee on Mutual Insurance, John M. Pittman, chairman, is as follows:

After a careful examination of all the testimony that we have been able to obtain we are of the opinion that we are not strong enough at present to organize a mutual company. Our investigation has convinced us that Hardware mutual insurance as presented by the National Association and by several of the State associations is perfectly safe and practicable.

We therefore earnestly recommend that the members of this association place a large share of their insurance with these companies, a list of which may be found in an article from *The Iron Age* published in our official programme for this year.

Salesmanship.

H. M. Coles of St. Louis, representing the Sheldon School of Scientific Salesmanship, made a formal address on "The Science of Salesmanship." Mr. Coles said that he was not present to set forth "a bunch of theories or a day dream of some enthusiast in business, but rather an up to date method of assisting business men to secure more business." The Sheldon School, he said, had proved a lifeboat which, while not preventing the storms that are bound to come, had "assisted 10,000 ambitious men to keep clear of the rocks and pass safely through open channels to a successful business career."

W. O. Hardeman's Paper.

One of the papers read at the Friday morning session was entitled "Funny Things in the Hardware Business," in which W. O. Hardeman of the Fones Bros. Hardware Company, Little Rock, entertained the gathering with a recital of some amusing reflections and anecdotes from his 21 years' experience in the Hardware field of Arkansas.

Address by Sam Jones.

The feature of the closing session was an address by the Rev. Sam P. Jones of Georgia, who happened to be in Little Rock and who appeared before the convention at its request. Mr. Jones' address was in his own characteristic style, full of wise and pithy sayings and interspersed with his peculiar wit and humor. His subject was "Character," which he termed the foundation stone on which every business should be built in order to stand. The association showed its appreciation of his address by a standing vote of thanks.

Financial Condition.

The report of the Finance Committee showed the association to be in first-class condition, full credit for which was given to the secretary. The report of the Auditing Committee complimented the manner in which the books and accounts of the association were kept by the secretary.

New Officers.

The following officers were chosen for the ensuing year:

PRESIDENT, Thomas B. Stewart, Newport.
FIRST VICE-PRESIDENT, R. P. Allen, Van Buren.
SECOND VICE-PRESIDENT, W. E. Dean, Portland.
SECRETARY-TREASURER, C. E. Taylor, Little Rock.

The following members of the Executive Committee for the term ending 1907 were chosen: Hamp Williams, Hot Springs; R. F. Roys, Russellville; J. P. Simpson, Malvern; John R. Mott, Helena. The other members of the committee, those whose terms expire in 1906, are F. B. Gregg, Little Rock; C. T. Rosenthal, Batesville, and J. M. Pittman, Prescott.

C. E. Taylor was chosen representative to the meeting of the National Retail Hardware Association.

The following standing committees were appointed for the year ending June, 1906:

COMMITTEE ON FRATERNAL RELATIONS: J. F. Maxey, Ozark; I. P. Rudolph, Gurden; Herman Carlsen, Lake Village.

PROGRAMME COMMITTEE: John A. Plummer, Marianna; J. L. Davis, Magnolia; H. W. Patrick, Russellville; W. L. Jeter, Jonesboro; R. P. Graham, Fordyce.

GRIEVANCE COMMITTEE: R. W. Merriwether, Paragould; L. E. Rowe, Pike City; Harry Hankins, Monticello; R. D. Jones, Magazine; A. T. Grimes, Walnut Ridge.

TRANSPORTATION COMMITTEE: K. G. McRae, Hope; Jno. B. Brown, Van Buren; H. E. Hawthorne, Newark; A. D. Malone, Plummerville; J. B. Hurley, Warren.

MEMBERSHIP COMMITTEE: W. A. Jackson, Dardanelle; W. W. McMinn, Newport; C. H. Stout, Black Rock; Ray Hayes, Wynne; Robert Conn, Stuttgart; C. F. Wingfield, Hope; G. H. Briant, Ashdown; W. F. Bracy, Little Rock; Lem Kirkpatrick, Argenta; L. D. Smith, Stephens; A. J. Lopp, Harrison; W. T. Avera, Pocahontas; Manly Fox, Clarksville; J. H. Morgan, Camden; L. A. Morgan, Strong.

Enlistment Committee.

An Enlistment Committee, composed of traveling men who are honorary members of the association and who represent the various lines carried by the merchants, was also chosen, as follows:

HARDWARE: W. O. Hardeman, Little Rock; Will G. Barnes, Little Rock; Frank Baptiste, Ft. Smith; W. A. Cook, St. Louis, Mo.; John M. Lofton, Chicago, Ill.; R. P. Young, Memphis, Tenn.

STOVES: Felix G. Blackwell, St. Louis, Mo.; W. N. Brandon, Nashville, Tenn.; J. J. Johnson, St. Louis, Mo.

VEHICLES AND IMPLEMENTS: Geo. L. Turner, St. Louis, Mo.; J. H. Frost, Florence; H. P. Alexander, Little Rock.

HARNESSES: J. W. Greene, Nashville, Tenn.

MISCELLANEOUS: Paul Litzke, Cincinnati, Ohio; O. H. Johnson, Dayton, Ohio; R. D. Fenton, Louisville, Ky.; H. D. LeFever, Indianapolis Ind.; F. B. Gable, Cleveland, Ohio.

Resolutions.

The Committee on Resolutions reported the following which were adopted:

Resolved, That this association extend its thanks and full appreciation to *The Iron Age* for the publication of the 1904 minutes and for its uniform favors during the year;

Resolved, That we extend our thanks for the courtesies shown by the following trade journals: *Hardware Dealers' Magazine*, *Stoves and Hardware Reporter*, *American Artisan*, *Iron and Machinery World* and the *Tradesman*;

Resolved, That the thanks of this association be tendered to our National president, W. P. Bogardus of Ohio, for his presence and helpful work during the convention;

Resolved, That we extend our thanks to the *Daily Gazette* and the *Daily Democrat* for their full reports of this convention;

Resolved, That our thanks be tendered to the Iron Mountain, Rock Island, Frisco and Cotton Belt railroads for reduced rates;

Resolved, That the thanks of this association be tendered to S. Norvell of the Norvell-Shapleigh Hardware Company of St. Louis for the delightful banquet given the members of this association.

Resolved, That we express our appreciation of the courtesies shown us by the following jobbers: Fones Brothers Hardware Company, Rose-Lyon Hardware Company, and J. H. Martin Arms Company, whose guests we were on the delightful boat excursion;

Resolved, That we thoroughly appreciate the kindness and hospitality of the traveling men, whose guests we were at the game of baseball and at the Forest Park Theatre;

Resolved, That this association strongly commend the efforts of the Little Rock Merchants' Freight Bureau as outlined by its manager, A. R. Bragg, in his address before this convention;

Resolved, That we pledge ourselves to the carrying out of the suggestions outlined by him in his address;

Resolved, That our hearty thanks be tendered the proprietor of this hotel for courtesies rendered;

Resolved, That the thorough appreciation of this association of the advertising given us in our official programme should be shown during the year in a practical way by our members.

These advertisers recognize the merit of the work we are trying to do, and they assist us with advertising to defray the legitimate expenses of the association.

Traveling Men as Honorary Members.

A resolution of appreciation by the members for the work of the traveling men during the past year was also adopted, and the traveling men were admitted as honorary members to the association on payment of \$1 dues. This was heartily approved by the traveling men present, and many of them united with the association.

Banquet.

The Norvell-Shapleigh Hardware Company, St. Louis, tendered a banquet to the members of the association and other visitors on Thursday. The occasion was a most enjoyable one in every respect. The unique menu was as follows:

Blue Points.	Cocktail.
Glaziers' Points.	Sam Bigelow.
	Boston, Mass.
Radishes.	Olives.
Consomme à la "Bridge Tool Company."	
Boiled Mackinaw Trout. "Wonder Sauce."	
"Blue Diamond" Back Terrapin.	
Sweetbread Piqua à la W. A. Cook.	Haute
New Green Peas.	Sauterne.
	Crumley, 1864.
Filet of Beef—Sauce M. O. Martin.	Atlanta, Ga.
New Asparagus.	New Potatoes.
"Diamond Edge" Sherbet.	
Broiled Jack Snipe, aux Dick Shapleigh.	Champagne.
"Conqueror" Tomato.	Chateau Pernley,
Missouri Strawberries. "Jersey" Ice Cream.	1904.
	Atlantic City.
Assorted Cakes.	
J. R. Walker, J. C. Flood,	
W. L. Neel.	
Coffee, "Black Prince."	Benedictine—Asbury.
Cigars.	The Jobbers' Friend.
"The Burning Shame."	Hot Springs, Va.

The speakers of the evening included a number of well-known Hardwaremen, whose discussion of the attractive topics assigned to them, as per the following toast list, made the evening one which will long be remembered by those present, numbering about 150 persons:

- E. W. Warren of Kingman Plow Company, Little Rock:
"Arkansas, the great Summer Resort."
- W. P. Bogardus, president National Retail Association:
"Special Brands or Manufacturers' Brands?
We pay our money and takes our choice."
- Hamp Williams, president Arkansas Retail Association:
"Is it profitable to burn out once a year?"
- T. B. Stewart, vice-president Arkansas Retail Association:
"How to make money in the Hardware business building court houses"
- J. J. Mandelbaum, Fones Brothers Hardware Company:
"What will we do when the American Manufacturers' Association sell consumers?"
- S. Norvell, St. Louis, Mo.:
"Why the jobber should quit selling special brands."
- E. E. Mitchell, Morrilton, Ark.:
"How to make money in the Hardware business running a bank."
- Gus Lyon, Little Rock, Ark.:
"Champagne for the Manufacturer, Beer for the Jobber, Water for the Retailer."
- Cliff Speer, Fort Smith, Ark.:
"Truth compels me to remark, there's only one real city in Arkansas."
- W. W. Webber, Fort Smith, Ark.:
"Why should not the manufacturer prevent the jobbers' salesmen from cutting prices?"
- R. D. Warren, Memphis, Tenn.:
"The close relation of the high ball to the expense account."
- W. A. Jackson, Dardanelle, Ark.:
"The retail store as a sample room for the catalogue house."
- J. F. Maxey, Ozark, Ark.:
"To our friends the farmers, who stand by us when they need credit."
- T. J. Mott, Helena, Ark.:
"To our customers who are perfectly good but never pay up."
- R. R. Williams (wireless telegraphy), *The Iron Age*, New York:
"We advertise our loving friends (for a consideration)."

Next Place of Meeting.

C. E. Speer, W. W. Webber and Jesse Miller of Fort Smith extended a cordial invitation to the association to hold its next meeting in that city. It was, however, decided, after discussion, to meet again next year at Little

Rock. A vote of thanks was tendered to the Fort Smith delegation for the invitation from that city.

Show Window Rivalry.

Three of the Hardware dealers of Little Rock located in the downtown district had agreed among themselves to prepare a show window with special care in honor of the meeting of the association. These three concerns, the Bracy Brothers Hardware Company, the City Hardware Company and the Foster Hardware Company, extended an invitation to the members of the association to call on them at their places of business and inspect and criticize the exhibits. The association, appreciating the compliment implied in the invitation, appointed a committee of 12 to examine the windows and report back to the convention. At the Friday morning session E. E. Mitchell of Morrilton, chairman of the committee, presented its report, as follows:

Your committee appointed to inspect and criticize show windows have to report that we decided to base our decision on three points, as follows: 1. Originality of design; 2. neatness of arrangement, and, 3. merit as a trade coaser. Your committee had a difficult task before it. We don't believe that any city could present three better Hardware window exhibits than the three prepared for us. We, however, after deliberation reached the following decision: City Hardware Company, 5 votes; Bracy Brothers Hardware Company, 4 votes; Foster Hardware Company, 3 votes.

The report of the committee was adopted with the thanks of the association to the competing houses.

Those in Attendance.

The following is a list of those who attended the convention:

- W. P. Bogardus, Mt. Vernon, Ohio.
J. P. Simpson, Malvern.
H. M. Cole, St. Louis, Mo.
J. Floyd McTyler, Little Rock.
John H. Martin, Little Rock.
H. H. Gibson, Casa.
W. H. Bass, Little Rock.
E. W. Horne, Little Rock.
E. L. Hamilton, McCrory.
W. W. Webber, Ft. Smith.
R. D. Warren, Memphis, Tenn.
F. B. Baptist, Ft. Smith.
C. L. Jones, Little Rock.
L. H. Simpson, Malvern.
F. G. Blackwell, St. Louis, Mo.
L. D. Smith, Stephens.
Earl Morgan, Stephens.
J. T. Barnette, Junction City.
R. L. Leap, Junction City.
W. E. Scott, Calico Rock.
S. Norvell, St. Louis, Mo.
W. A. Cook, Little Rock.
Frank Laster, Ft. Smith.
W. C. Ingram, St. Louis, Mo.
F. C. Vawter, Connersville, Ind.
J. H. Frost, Florence, Ala.
W. J. Pendergast, Altus.
R. N. Vall, Morrilton.
Frank Lyon, Little Rock.
Frank Howe, Memphis, Tenn.
L. K. Mandelbaum, Little Rock.
J. T. Kendrick, Clarksville.
H. E. Hawthorne, Newark.
J. H. McClure, Ft. Smith.
Jesse Smith, Ft. Smith.
John B. Brown, Van Buren.
E. E. Mitchell, Morrilton.
T. J. Mott, Helena.
James A. Brown, Memphis, Tenn.
L. Burrus, Memphis, Tenn.
A. B. Paddock, Helena.
Hiter King, Little Rock.
H. W. Patrick, Russellville.
W. C. Foster, Louisville, Ky.
R. D. Fenton, Little Rock.
H. D. Lefever, Little Rock.
W. P. Brown, Memphis, Tenn.
J. L. Davis, Magnolia.
Ernest M. Warren, St. Louis, Mo.
W. L. Jeter, Jonesboro.
W. A. Jackson, Dardanelle.
J. A. Battle, Chattanooga, Tenn.
Henry Hankins, Monticello.
W. O. Hardeman, Little Rock.
W. F. Bracy, Little Rock.
J. F. Maxey, Ozark.
W. H. Maxey, Cedarville.
T. B. Stewart, Newport.
R. F. Roys, Russellville.
J. Van Dokkum, Little Rock.
S. E. Orr, Little Rock.
A. D. Malone, Plumerville.
R. P. Graham, Fordyce.
R. P. Young, Stuttgart.
Robert Conn, Stuttgart.
H. B. Dudley, DeWitt.
K. S. Skinner, Brinkley.
Elijah Whittier, Marvell.
Frank B. Gregg, Little Rock.
S. E. Cooper, St. Louis, Mo.
P. F. Lenea, St. Louis, Mo.
F. B. Cable, Kansas City, Mo.
G. T. Michael, St. Louis, Mo.
G. P. Robinson, St. Louis, Mo.
L. E. Rowe, Pike City.
Paul R. Litzke, Little Rock.
C. C. Rose, Little Rock.
James J. Mandelbaum, Little Rock.
A. F. Cook, Little Rock.
D. E. Barbee, Little Rock.
J. B. Hurley, Warren.
R. W. Meriwether, Paragould.
W. G. Barnes, Little Rock.
R. S. Anderson, Little Rock.
Mr. Manly, Clarksville.
M. W. Fox, Clarksville.
G. L. Turner, Little Rock.
C. L. Craighead, Little Rock.
James Green, Little Rock.
W. E. Dean, Portland.
C. E. Burton, Dowagiac, Mich.
S. M. Abeles, Memphis, Tenn.
S. M. Beattie, Newport.
L. U. Stedman, Paragould.
H. P. Alexander, Little Rock.
J. B. Avera, Pocahontas.
W. T. Avera, Pocahontas.
A. S. Goodfriend, Little Rock.
R. H. Strong, Ozark.
John J. Johnson, Hope.
O. H. Johnson, Little Rock.
J. M. Pittman, Prescott.
M. J. Foy, Little Rock.
George Briant, Ashdown.
K. G. McRae, Hope.
E. Y. Blakely, Prescott.
A. D. Reynolds, Ozark.
A. Ruebel, Lonoke.
M. B. McNeeley, Little Rock.
W. D. Fulton, Little Rock.
C. E. Shoemaker, Little Rock.
Otis P. Johnson, Little Rock.
H. M. Watson, Little Rock.
C. H. Stout, Black Rock.
A. T. Grimes, Walnut Ridge.
George S. Hooper, Memphis, Tenn.
Evander Williams, Memphis, Tenn.
George Armistead, Memphis, Tenn.
H. E. Pearce, Clarendon.
J. A. Surridge, Benton.
F. O. Snow, St. Louis, Mo.
Chas. T. Pittman, Prescott.
P. L. Hamblen, Little Rock.
C. E. Speer, Fort Smith.
R. L. Matthews, Morrilton.
Chas. Wingfield, Hope.
W. F. Coleman, Little Rock.
W. M. Harrell, Conway.
W. M. Green, El Dorado.
R. D. Smith, Little Rock.
G. S. Whitmore, Searcy.
Hiram Tatum, Booneville.
B. F. Coleman, Devall's Bluff.
W. M. Maxey, Devall's Bluff.
A. N. Powell, Devall's Bluff.
J. O. Smith, Carlisle.
Frank Laster, Fort Smith.
D. H. Davis, Little Rock.
O. O. Scroggin, Morrilton.
Roy Hays, Wynne.
J. H. Morgan, Jr., Camden.
A. S. Sutton, Little Rock.
E. A. Davis, England.
H. E. McRae, Arkadelphia.

PRESIDENT'S ADDRESS.

BY HAMP WILLIAMS, HOT SPRINGS, ARK.

It is with great pleasure I address you at this our sixth annual convention. I feel the importance of my position and yet I feel my inability to serve you as you deserve. I have great confidence in the future success of the association and congratulate you on the fact that we are gaining ground every day. As I look over this representative body of business men I feel that each one carries within him some valuable experience, some thought that when imparted to us will be valuable information.

Business men have little time to call on one another in their places of business during the year; so once a year in convention assembled we receive and impart what knowledge and experience we have had. The past year has been very profitable to some of our members, while to others it has been very disastrous.

BENEFITS BETWEEN CONVENTIONS.

In our deliberations we hope to make the weak stronger and strengthen the strongest. We want the best of it. Where one has been unfortunate and had to experience a loss financially we hope to receive from him valuable information whereby the others may profit. On the other hand, those of you who have met with success can also impart valuable information and teach others how they may succeed. I hope that some member will suggest some plan at this meeting by which the members of this association will derive more benefits between our annual conventions. The very moment we inaugurate some plan or system by which our members receive direct benefits, just then we have accomplished the end we have all been striving for—that is, to enlist every retail Hardware dealer in our State. When we show them there are direct benefits to be derived from this association they will join us almost unsolicited. This is an association of retailers, and as such it is paramount that all the retailers in the State should be members. The work we have in hand is one that is practical, one that will do much good to the entire organization if followed up from year to year. Personally I have enlarged views of the possibilities of our association, and I know that connection with it in this State is indispensable to the dealer who desires to keep up with the procession, who wishes to be regarded by those with whom he does business as a progressive merchant and valuable citizen, loyal to his State and to the particular line of business of which he is a representative. In my opinion mutual insurance will help in this direction, and this will be brought before you at this meeting by the Committee on Insurance. I hope you will act upon it favorably, as it is a step in the right direction. As for the work of our association the past year, you will get a very complete history of its growth and management from the report of our efficient secretary and through the reports of the different committees.

CATALOGUE HOUSE COMPETITION.

The National Retail Hardware Association has done a great deal the past year toward relieving us from the encroachments of catalogue house competition, and I firmly believe they have it well in hand, and by another year I hope to see the battle won.

The president of the National Retail Hardware Association, W. P. Bogardus of Mt. Vernon, Ohio, is with us and I am glad to report that he will explain to you what the National Association has been doing the past year, and by giving him close attention you will no doubt learn a great deal of what it is doing in regard to catalogue competition.

Mr. Norvell of the Norvell-Shapleigh Hardware Company of St. Louis, who is chairman of the Joint Committee of Jobbers and Retailers, is also with us and has a report to make showing the first-class work it has been doing during this year. Hear him; it is worth your time, as our interests are mutual. The fact alone of Mr. Norvell leaving his business and appearing before us in the interest of anticatalogue competition should be sufficient to convince us that it is high time that we retailers were waking up to the necessity of prompt action.

PARCELS POST.

In connection with catalogue house competition I want to call your attention especially to the Parcels Post bill. If this becomes a law the power of the catalogue houses will be quadrupled. If all the merchants effected by this law, however, will concentrate their forces and make one concerted effort they can defeat this measure. I hope that you will at this meeting inaugurate some plan of action and make an effort to enlist the interest not only of the Hardware dealers but the druggists, dry goods and general merchants, furniture, grocery and Implement dealers all over the State and send to our Congressmen our remonstrance against such a measure. If we decide to adopt mutual insurance I am in favor of employing a competent man to make a thorough canvass of the State in behalf of our insurance company and at the same time enlist every merchant against the Parcels Post bill and show by letter and petition to Congress that all the business men of this State are opposed to that law.

In conclusion I want to thank our secretary especially for his untiring efforts in behalf of our association. I want to thank the traveling salesman for their presence at our meeting and their help on the outside in securing members. We would do well to enlist them as honorary members of this association. We could not have made anything like the headway during the year that we have had if not been for them.

The jobbers and manufacturers whose names appear on our programme should be remembered by every member of this association. Give them a chance to sell you some goods, because they are our friends. They have proved it by advertising with us, thereby making it possible for our secretary to present you with one of the neatest and most complete programmes we have ever had.

Individually I want to express my thanks to every member of this association for his cordial support during my term of office, and I hope that this association may continue to grow and that before another meeting every legitimate retail Hardware dealer in the State will be a member.

SECRETARY'S REPORT.

BY C. E. TAYLOR, LITTLE ROCK, ARK.

Your secretary has had during this year the pleasant experience of seeing some results from his work. I have issued during the year 12 circular letters to the members, an average of one letter per month. Some of these letters—in fact, most of them—were sent not only to the members but to every Hardwareman in the State. During the year I discontinued the use of the so-called carbon letters and have gone to the expense of writing personal letters to each firm. I find that my communications have been received with more consideration, due, I think, in some measure to that fact. The members of the association have been hearty in their responses when I have asked them for help, and to that fact is due the healthy growth which our association has enjoyed.

TRAVELING MEN'S CO-OPERATION.

The traveling men, who as individuals and as a body were favorable to our work before the 1904 convention, during the year that has passed have been not only favorable but very zealous and helpful in furthering the work of this association. The traveling man who goes from town to town calling upon merchants, who are, in most cases, his close, personal friends, has an influence which is not enjoyed by the house he represents nor even by the State secretary of any Hardware association.

The traveling man was quick to recognize this Hardware association as an agency which could be made very beneficial to the Hardware, Vehicle and Implement merchants in the State. Feeling this importance, he has not hesitated to throw all his influence with it wherever needed in favor of our association, and many members who have joined our association during the last year have come to us directly as a result of missionary effort put forth by our indispensable friend the traveling man.

DIRECTORY OF DEALERS.

The list of names of dealers in Hardware, Vehicles and Implements as presented in our official programme is

as nearly correct as it can be made with the information at hand. If there are any errors in this list I will thank you to point them out.

At your last convention I was appointed as a delegate to the convention of the National Retail Hardware Association, which met in March at Minneapolis. It was impossible for me to attend at that time and I tried in vain to secure some one to go in my stead.

Under the terms of our membership with the National Retail Hardware Association each member of this association is entitled to a copy of the "National Hardware Bulletin," and if he does not receive it the fact should be reported to the State secretary. The intention is to provide every member with this valuable book.

CHANGE OF NAME.

The National Retail Hardware Dealers' Association at its Minneapolis meeting eliminated as unnecessary the word "Dealers" in its name, and the association is now called the National Retail Hardware Association. It might be well for this association to consider the same thing in reference to our name, which is a little bit long and unwieldy.

CATALOGUE HOUSE COMPETITION.

The catalogue house matter has been discussed so many times that it is unnecessary to say much of it here. President Bogardus will doubtless have something to say on the topic, and Mr. Norvell's address will contain some interesting facts relative to the means that are being used to counteract the trade getting efforts of this great foe of the retailer.

ONE AND A THIRD FARE.

For the Transportation Committee I secured a one and one-third rate on all roads on the certificate plan, provided 50 tickets were sold. The difficulty has been heretofore that our members would not bring the receipt and pay the regular fare. Consequently, while railroads have always granted return trip privileges, they have invariably protested against doing it. I believe, however, that if we could show 100 paid tickets at future meetings we could secure a one-fare rate.

INCREASED MEMBERSHIP.

The number of members of the association has constantly increased during the year. The printed matter sent out in the last six months by us has borne fruit. Every circular letter has brought in several members. We have now enrolled 103 members, having received during the year 22 new members. This includes the work to and including June 19. A large Membership Committee appointed at the last convention has had its weight and has been of no little assistance in influencing merchants to join the association. Two firms during the year sold out, but we retained their successors as members. One went out of business.

THE CATALOGUE HOUSE QUESTION AND SPECIAL BRANDS.

BY S. NORVELL, NORVELL-SHAPLEIGH HARDWARE COMPANY, ST. LOUIS, MO.

I am here to talk to you on two subjects—the catalogue house question and special brands. These are two separate and distinct questions, but the committee of the American Hardware Manufacturers' Association diplomatically mixed up these two questions into one of those celebrated Hot Springs mint juleps and most of the mint was special brands. I was invited to that meeting with the assurance that there would be "nothing doing." I therefore did not prepare a formal paper. I was entertained most generously by the manufacturers, and so it pains me deeply to make the following remarks, but I am a martyr to my duty as chairman of the Catalogue House Committee.

I intended to make only a few brief statements at Hot Springs. Just an hour or two before the time set for my address I was handed the resolutions adopted by the manufacturers. No doubt all of you have read these resolutions. If you have not you should, because they are exceedingly interesting and you should not miss them. Probably in all these years you have not fully appreciated the true depth of the depravity of the character of

the jobber from whom you have been buying your goods. After reading these resolutions I went into that meeting and said a few plain things in defense of the Hardware jobber and of special brands. Part of my remarks has been published in the trade press, but entire paragraphs have been left out. It has been explained to me that when I faced the stenographer he took down what I said, and when I turned from him he could not hear me, and so that part of my remarks was not reported. I therefore welcome this opportunity to touch upon some points which were altogether omitted in the report of my Hot Springs address.

It would weary you if I attempted to review all the work of the Catalogue House Committee. A great deal has been published on this subject, many phases of the question have been discussed. It is enough to say that we are now reaching a stage in our work where nearly all the manufacturers in Hardware, Sporting Goods and Cutlery lines have been classified as to their attitude on this catalogue house question. There are certain manufacturers who continue to sell catalogue houses who resent the interference of the Catalogue House Committee. Notwithstanding the fact that they state 95 per cent. of their goods is sold through the Hardware jobbing and retail trade, and only 5 per cent. is distributed through catalogue houses, notwithstanding the fact that the jobbers of the National Hardware Association, the jobbers of the Southern Hardware Association, the outside jobbers who are not connected with any association and the retail dealers connected with the National Retail Hardware Association have laid before these manufacturers the great evils that result to the jobbing and retail Hardware trade from the methods of doing business of such catalogue houses, and that they have prayed them for relief, these manufacturers say to us, in effect: "You don't know what is for the good of the Hardware trade of this country. Your intentions may be the best in the world, but you are all wrong. We know all about it; we know the kind of medicine you need."

MANUFACTURERS' CREED.

As I said before, I believe the recent resolutions adopted at Hot Springs represent the opinions of only a small part of the Hardware manufacturers of this country. They stand very largely for the opinions of a comparatively few manufacturers who have declined to meet the views of your Catalogue House Committee. If we should put the ideas of these few manufacturers into the form of a creed it would read about as follows:

We believe, first of all, in protection—for ourselves.

We believe the Government should protect our infant efforts by high protective tariff so jobbers and retailers of this country will be compelled to buy from us exclusively.

We believe the people of this country should protect our machinery and our product by patents, so nobody else can make the same goods in which we deal.

We believe it is our duty to still further protect ourselves by forming trusts and combinations, so there will not be any competition among our own number.

We believe in selling our goods on the rebate system, by which we hold all the jobber's profit on our goods for several months until he makes us a statement that he has not cut our prices.

We believe in having a fixed selling price for a certain territory, so no one jobber can get more than a certain amount of business. This jobber might become too powerful. We can handle them better when they are divided.

We believe in not only selling the wholesale Hardware trade, but also in selling any other class of jobbers, such as wholesale wooden ware houses, wholesale grocers, &c.

We believe in not only selling wholesale merchants, but we also believe in selling catalogue houses at the same prices as we do jobbers.

We believe in selling whatever retail trade we please, we ourselves to decide what class of retail dealers is entitled to buy of us.

We believe in selling the foreign trade just as cheaply as it is necessary to get the business,

regardless of what we sell our goods for in the United States.

We believe it was "perfectly horrid" for President Roosevelt to intimate that the Panama Canal Commission should buy American goods at the same prices at which we sell them to foreigners.

We believe every class of trade, except us manufacturers, should look out for themselves, and if they cannot take care of themselves they ought to go to the wall.

We believe the Hardware jobber should be perfectly satisfied for us to sell Hardware to the wooden ware and grocery jobber.

We believe if a retail dealer cannot sell our goods and make a profit at the prices made on the goods by catalogue houses to consumers he should go to farming or into some other business.

We believe it is our duty to kill off jobbers' special brands, as the sale of such brands is liable to interfere with our control of the situation.

We who do not make special brands ourselves believe the best way to kill the special brands made for jobbers by other manufacturers is to discredit by resolution all special brands in the eyes of the retail trade.

We believe when a retail dealer finds he is competing on our own brands of goods, not only with the retail wooden ware trade, with the retail grocery trade, with the drug trade, but also finds himself in competition with the catalogue house to whom we sell, that such a retailer makes a serious mistake and is disloyal to us when he buys from some jobber special brands he can control.

We believe that the jobber who seeks relief from competition on our own brands by buying special brands is not loyal to us, and if he does not stop handling such special brands we will threaten to run both jobbers and retailers out of business by selling our goods direct to consumers.

We believe, finally, in all kinds of protection for ourselves and no protection of any brand, either special or manufacturers' brands, for anybody else.

We believe it is presumptuous, impertinent and out of place for jobbers or retailers to suggest to us that we cannot sell our goods to whomsoever we please, regardless of the general demoralization of the Hardware trade that may follow.

We believe it is perfectly proper for us to put whatever restrictions we wish upon the sale of our goods and to maintain these restrictions not only by withholding the jobber's profit but by declining to sell him goods if he does not follow our views.

We believe if jobbers and retailers should not like the manner in which we do business, and if they should intimate they would not carry our brands, such jobbers and retailers are un-American.

We believe such action on the part of jobbers and retailers would savor of the boycott and trade unionism, and therefore they should be held up to criticism in all the trade press.

We believe as we do all the advertising the trade press should see only our side of a question.

We believe in dull times jobbers should load up with enough stock of our own brands, for cash, to last them several years, because they should know from experience in the last few years when business was good we were not able to turn out enough of our own brands to supply the trade.

We believe when the jobbing and retail trade of the country come at us with the catalogue house question we are "foxy grandpas" when we stir up some mud and hide ourselves by bringing up the issue of special brands.

Mr. Norvell then proceeded to give an account of the work of the Catalogue House Committee. He called attention to the fact that jobbers' associations in other lines, such as saddlery, dry goods, furniture, plumbing, &c., are taking up energetically the catalogue house question.

He stated he did not claim that all jobbers' special brands are good; that that would be just as great folly

as to claim that all manufacturers' brands are of the best quality. He admitted that there are abuses in special brands which should be corrected, but he expressed the belief that the resolutions of the manufacturers at Hot Springs would leave the impression upon the minds of the retail trade that all special brands of all kinds are of poor quality and put on the market to impose upon the retail dealer and consumer. He repeated the statement that the advantage in special brands to the retail merchant is exactly the same as the advantage to the jobber; that it put him in position to control a certain amount of his trade, and that this was impossible with manufacturers' brands that can be bought of every class of merchants.

JOBBER'S CARRY A FULL ASSORTMENT OF MANUFACTURERS' BRANDS.

He stated that the resolutions of the manufacturers left the impression that jobbers sell nothing but their own special brands. Every intelligent retail dealer knows that jobbers carry not only their own special brands, but a full assortment of manufacturers' brands. In the nature of the case, a jobber can successfully sell his own special brands to only one dealer in a town. No retail dealer would push a line of special brands upon which he had no protection against his competitors. Therefore as it is the custom of all jobbers to sell a number of different dealers in a town such jobbers must sell manufacturers' brands to the others.

He maintained that the resolutions conveyed the idea that certain manufacturers could not get their brands of goods before the consumer except through the catalogue house. He challenged any manufacturer in the country to come out over his own name and state that the reason he sells catalogue houses is because this is the only avenue through which he can reach the consumer. He said in making such a statement the manufacturers made a shot which went entirely too far.

COMPLETE LINE UNDER ONE BRAND.

He further claimed one of the greatest advantages of a special line of goods is that a complete line can be carried by the dealer under one brand, not only consistent in quality and finish, but put up under the same style labels and in a similar class of packages. He said when a retailer advertised part of this line he advertised the entire line; if part of the line was satisfactory it led to purchases on the rest of the line, but on manufacturers' brands this naturally could not be true, as each article is in a different style box, under a different brand, and the sale of one article which may be satisfactory does not in any sense or manner help the sale of the rest of the line that this dealer controls.

Mr. Norvell impressed upon his hearers that many improvements in the fashion of goods, in finish and in the manner in which they are put up had been suggested by jobbers. He called attention to the fact that on a number of lines the keen competition among manufacturers on their own brands had led to such deterioration in quality that some jobbers had found it advisable to bring out goods of superior quality under their own brands because they believed there was a demand for goods of high grade in these lines and that the retail dealer and consumer were willing to pay the price of a better article. He cited a number of instances where, he said, manufacturers, finding there was a demand for these goods of higher grade, had afterward introduced them under their own brands.

JOBBER'S IN CLOSER TOUCH WITH RETAILERS' WANTS.

He dwelt especially upon the fact that some of the principal jobbers in the country seemed to be in closer touch with the wants of the retail trade, particularly in the way of packages, than the manufacturers. He called attention, for example, to the fact that the manufacturers of Saw Screws put them up $\frac{1}{2}$ gross in a box, and inquired how long it would take the average retail dealer to sell 6 dozen of a Saw Screw of one size. He stated several jobbers repack these goods 1 dozen in a box, and he recommended that the manufacturers as a whole devote more attention to the convenience of the retail trade in this respect.

JOBBER'S AND RETAILERS NOT THE AGGRESSORS.

Mr. Norvell dwelt at length upon the point that the jobbers and retail dealers were not the aggressors in this catalogue house fight. He read extracts from literature of catalogue houses in which they gave the consumer to understand he was being overcharged and imposed upon by the retail merchant. He said the catalogue houses were simply reaping what they had sown and that the jobbers and retailers of this country would certainly be men of very weak spirit if they did not use what weapons they could in retaliation against the aggressions of catalogue houses.

He spoke of the underhand methods being used by catalogue houses to obtain goods that had been denied them by the manufacturers, and referred to their broken pledges to the manufacturers in the way of maintaining prices. He called attention to their frequent misunderstandings and disagreements with manufacturers who had attempted to control their selling prices.

AVERTING SLAUGHTER.

He especially criticised the logic of a manufacturer who said he would be compelled to sell a catalogue house because if he did not sell this catalogue house it would slaughter the price of his goods. "Then," said Mr. Norvell, "you admit you are afraid of this catalogue house? You admit its tactics of cutting prices lead you to meet its views? Isn't the logical conclusion of this argument that the jobber in order to persuade you to do what he desires should demoralize the price on your goods and make you fear him, and then probably you will be as considerate of the desires of the jobber as you now seem to be of this catalogue house?"

"It is well known," said Mr. Norvell, "that the catalogue houses are secretly backing the movement for parcels post. Every intelligent jobber and retailer in the land knows what a tremendous blow the parcels post would be to the retail trade of the country and in the development of the small town."

HOW SOME MANUFACTURERS LOOK AT IT.

Extracts, without names, were read from some interesting letters from manufacturers on the catalogue house question. One manufacturer who makes a very small article sold by the retail trade in exceedingly small quantities wrote a retail dealer in reply to a letter asking how he could compete with the prices of catalogue houses that if this retail dealer would send him an order for \$100 worth of these goods he would make him as low a price as he made the jobber. This quantity of this item would last that retail dealer 20 years.

Another manufacturer, who makes very expensive Machinists' Tools, admitted that he sold not only catalogue houses and the retail trade in large cities, but also sold direct to consumers, and at the same time expressed dissatisfaction with the small sales of the jobbing Hardware trade on his goods.

One of the head men in a catalogue house informed Mr. Norvell that a certain association of manufacturers decided it would not sell catalogue houses. Two days after the meeting one of the members of this association called on this catalogue house and attempted to secure an order from it for his line of goods under special brands of its own.

Another manufacturer sold a catalogue house a very large quantity of defective goods at a special price. The catalogue house issued a postal card offering these goods at less than the cost to many jobbers. The matter was immediately taken up by the joint committee, and this manufacturer went to Chicago and persuaded this catalogue house to allow him to take back all the goods he had sold it. It is not known just what argument was used.

SINCERITY LACKING.

Mr. Norvell concluded his remarks by stating that his experience with certain manufacturers on this catalogue house question reminded him of the story of the socialist who claimed men should have all things in common. A friend said to him: "Now, if you had \$100,000 would you give me \$50,000?" "Certainly," said the socialist; "\$100,000 is too much money for any one man to own." "Do you mean to say," said his friend, "if you had 100 acres

of land you would give me 50?" "Without the slightest hesitation," replied the socialist. "Now," said the friend, "if you had two pigs would you give me one of them?" "Not on your life," answered the socialist; "you know I have two pigs." So with certain manufacturers. They offer us a great deal of aid and comfort and co-operation till we get down to a point where they run the risk of losing a little business.

SOME WAYS TO RAISE THE STANDARD OF EFFICIENCY OF OUR CLERKS.

BY FRANK B. GREGG, LITTLE ROCK, ARK.

There has been much said in trade papers, conventions and meetings as to the qualities one should possess to make him a good clerk, or, in fact, a good man in any calling. The fact that a man must be honest, sober and industrious to succeed in business has been dinned in our ears ever since we can remember. But what most men need is some one to make them do what they know they ought to do; to bring out the best there is in them. They know what they should do, but wait for some one to draw them out and urge them on. Therefore

TO RAISE THE STANDARD OF EFFICIENCY OF OUR CLERKS

we must go back beyond the clerks and take care that the proprietor or manager is that kind of a man. He must be made of the right stuff through and through. He must be right under the surface as well as on the surface—right mentally, morally and physically. Almost all large business concerns have grown from small beginnings, and away back when the foundations of these houses were being built you will find some man or set of men who could see into the future, who had confidence in their country, confidence in their fellow man and confidence in themselves; men who could increase their business and multiply their sales. They collected around themselves men whom they could make feel as they felt and men who would go after the business and get it.

Human nature is very much the same the world over, and these men had the same material to begin with that we are using to-day, only possibly they used greater care in selecting their men and they went to greater pains to educate and draw them out than we do. I believe the majority of clerks are willing and anxious to improve themselves and will meet us more than half way when we show genuine interest in them. This interest must be real and not assumed.

GIVE HIM A CHANCE TO GROW.

When we have the welfare of our men at heart and really and truly endeavor to help them they will appreciate it and in return will give us services that money can't buy. When we arouse their interest, love and admiration they will give us the best there is in them, and we should expect no more from any man. When we get a man so that he is willing to do his best for us we must use him and give him a chance to grow to make his best better. We often underestimate the ability of our men, and it is only by giving them the opportunity to do more and believing they can do more that we get them into the habit of attempting to meet our expectations.

Rules, order and system are all very good and necessary in a well managed business, but sometimes we are such cranks about having everything done in a certain way that we give more attention to the methods than we do to the men. If we first get our men to feeling right and striving to please us we will not have much trouble enforcing rules. In many instances it is well to look to our men for results. That is what we are after. No two men will handle a sale or arrangement of goods or any other proposition in exactly the same manner, yet each one may get the same result. When we get a man interested in our work, after we are sure that his heart and head are right, we need not be afraid to throw some responsibility on him and leave the results to him.

At a meeting of our men the other night I asked them what helped them the most, and they were almost unanimous in saying that encouragement and appreciation did the most good; that they did not like to be called down for failures and mistakes, but the thing that would make

them strive hardest was a sign of approval for work well done.

BIG AND SMALL SALES.

We all like big sales with a good profit and are very apt to pat the man on the back that makes the big sales; but the small sales are just as necessary to our business and often require more good salesmanship to make than the larger ones. The good clerk will wait on a little child or an old colored woman just as pleasantly and carefully as he will on our best customers. One sale does not make a business, but the customers who leave satisfied and come back again do. It is not getting a customer, but keeping him, that counts. You have often heard it said that "any one can sell a man what he wants, but it takes a salesman to sell him something that he does not want." This old saying is all wrong and does not agree with modern business methods. A good merchant does not want to sell to any man anything that is not worth to the purchaser what he pays for it. We should educate our trade that they may come into our stores and after examining our goods buy or not buy, as they may decide, without being bored. Be attentive, but not overpersistent.

MEETING EVERY WEEK.

One of the greatest helps to clerks is to have a meeting, say one night each week, where they do nothing but talk and compare notes, each man feeling free to speak. We should encourage them to talk over different lines of goods. Get each one to express his opinion and also to give the opinions of the customers he has had on the goods. It is well to get their advice and ideas on store arrangement, store management and on new goods to be handled. Let them know something of the plans of the house. If a man shows a special liking or aptitude for some particular line we should encourage him to specialize. Get him to learn all he can about his line and then get him to tell the other men, ourselves included. Do not try to know it all. We should not be ashamed to learn from our clerks, because they can teach us many things, even if we are paying their salaries.

One of the greatest helps from regular meetings of the men is to be found in the wiping out of petty jealousies. It creates a kindly feeling in each clerk for his fellow clerks and fills him with a desire to help the others all he can. Get them to understand that a business crew to be successful should work like a boat crew—all pull together and do team work, each man strengthening and supporting the others all he can.

CULTIVATE THE TRAVELING MAN.

There is one source from which both the merchant and the clerk derive much benefit. We have come to regard it so much as a matter of fact that we fail to realize how much we get from and how much we owe to the traveling man. He is always willing to help us and give us good ideas, to listen to our troubles and show us how to overcome them. He educates the clerks in every way possible, explaining the goods to them, telling them which goods experience has proved to be the best, &c. He teaches them loyalty to the men they work for and many other helpful things.

Have no favorites, but recognize and commend ability, even in the delivery man or the porter. Every position in a business house is important, and only when a man fills his position and overflows it is he on the road to promotion.

KNOW THE GOODS.

Next to a man's willingness and endeavor to do good work comes his experience and knowledge of the goods. And here, Mr. Hardwareman, is where you must do your part. First, our goods must be of the best kinds and makes and must possess merit. They must be bought right and priced within reason, for you know the catalogue houses are after our scalps.

Teach the men to know the goods, what the especial points of merit are, and also to know the strong and weak points of competing lines, so that they may bring out strongly the points of merit our goods have over competing lines. Do not run down the goods of others,

but simply dwell on the good points wherein our lines excel.

Knowledge is power, and a thorough knowledge of our goods will give us an enthusiasm and persuading power that nothing else will. One great reason for the inefficiency of clerks is that they are expected to do so much that they must do this work hurriedly and loosely. This causes mistakes and waste. The price of excellence is sticking to it until you get a thing done just right.

CONCESSIONS IN PRICES.

Another thing, we must avoid making prices and concessions that we will not allow our clerks to make. It humiliates the clerk and lowers him in the estimation of his customer. We must try and have our prices right, with every salesman on the same basis. If under certain conditions concessions may be made let it be arranged and understood that one man can make the concession as well as another, and after a salesman has made a proposition back him up. If he makes a bad bargain don't go back on it. Live up to his agreement.

If we would have an efficient selling force we must labor continually to improve ourselves. Teach our men not only to do right, but be and feel right. Buy good goods and sell for a profit and teach them to know the goods thoroughly. Insist on straightforwardness and fair dealing, without the least trickery or sharp practice. When questions are brought to us for decision decide them as promptly as possible and get action without delay. Give the men time to do their work. Pay them what their work is worth to us and treat them like we would want to be treated.

We to-day have many future merchants working for us, young fellows who are going through just what we went through. They have the same impulses, desires and longings that we had. Remembering our own experiences we should help them all we can, rejoicing in their triumphs and having sympathy and charity for their failures and mistakes.

UNFAIR PRACTICES ON THE PART OF RETAILERS.

BY W. W. WEBBER OF THE WEBBER-AYERS HARDWARE COMPANY, FORT SMITH, ARK.

I have consented to address this convention on the condition that I be allowed a free lance, and I trust that what I have to say may bring forth abundant fruit not only to the retailer but to the jobber. At the outset I want to congratulate the retailers of Arkansas on the strong and compact association that follows six years of effort, and as one of the jobbers of Arkansas, voicing as I think I do the sentiment of every jobber of Arkansas and of the South, I want to say that we approve of your association and its principles, because this is the age of co-operation and community of support.

On behalf of the jobbers I wish to call your attention to some of the ethics and amenities of commercial intercourse that seem to have escaped the notice of many retail merchants by reason whereof the life of the jobber is rendered less pleasant and profitable. We want you to understand that we are not here in the rôle of critics, but we must go on record as being unalterably opposed to certain methods now obtaining among the retailers of this and other States.

LAXITY IN MEETING TERMS.

First, the general and usual terms granted by the jobber of Hardware are 60 days, or 2 per cent. discount for cash in ten days, and these words mean just what they convey or they mean nothing at all; yet the experience of many of us is that they are taken by some dealers to mean, "Pay when you please, and take discount, too." Now this is an evident injustice to the jobber. Those of us who have any business to speak of have some 1000 or 1500 customers on our ledgers and our shipments mean, say, 75 to 100 orders a day. Now we will assume, for example, that Fones Bros. of this city ship to-day 100 orders, averaging \$20 each, or 50 orders, averaging \$40 each. This is a sum total of \$2000 for to-day.

These orders go to all parts of their territory and into

the hands of men of different and varying characteristics. One-half, we will say, are discounted within the ten days, and of the other half part are discounted (erroneously, of course) at the end of 60 days, and the balance run beyond maturity, say, 60 days, and the buyers decline to pay interest. Now, I want to ask if there is a man here to-day who thinks the latter half have acted in good faith. As an initial proposition they all got goods at the same price, yet only half of them have lived up to their contract; and with the other half the discount at the end of 60 days was probably allowed or the interest for overtime was probably not insisted on because of the fear that we might estrange a customer and lose business. I want to say right here that a jobber who does not remember those who are fair and just in their dealings and views is a singular character, and those who habitually resort to the petty discount and interest feature need never think they stand high in the estimation of those affected.

REJECTED SHIPMENTS.

I want also to call your attention to the method of handling rejected shipments. It is the practice of retailers when they have rejected an article to ship it back to the consignor. This is all wrong, because when you reject it your connection with it ceases and you have no more right to ship the article back than you have to throw it in the river, because you are then assuming control of something that does not belong to you. Your rejection of the article ends your control, and so far as you know the shippers might sell it to your neighbor, pay you the expense incurred and end the incident.

In conclusion I want to impress upon you that if you desire to discount your bills do so within the limit given; if not, then pay within the 60 days, and if they run past maturity pay interest if it is demanded, because it is best that you do so. Every jobber in Arkansas pays interest to his bank, and so whenever you withhold money from him you make him that much more of a borrower, and your failure to pay him the interest charged makes him that much more of a loser.

Pressure on our space prevents our giving in this issue other interesting papers which were read at the meeting, and they are accordingly held for publication until next week.

MARSHALL-WESCOAT COMPANY.

ANNOUNCEMENT is made that Walter Pringle has purchased the business and stock of Marshall, Wescoat & Co., large wholesalers of Shelf and Heavy Hardware, Cutlery, Agricultural Implements, Guns and Ammunition, Charleston, S. C. A corporation is now being organized to continue the business under the title of the Marshall-Wescoat Company, and it is proposed to issue \$120,000 in stock, equally divided between common and preferred. Everything is expected to be in running order on July 1, when the new company will formally begin operations.

The Star Cable Dog.

The Star Expansion Bolt Company, 147 Cedar street, New York, has lately put out a new patent dog for fastening cables or small pipes, as shown in the cut. It is made of malleable iron, galvanized to stand the A. T. & T. test, and the maker states that the hook can be bent snug over the cable without cracking or chipping. In setting it is only necessary to drill a hole just large enough to insert the shank and then hammer in the wedge. The principle is such that this causes a positive expansion at the inner end so that any subsequent strain on the hook will only cause it to become more firmly imbedded in the wall. In the maintenance of telephone, telegraph and electric lines a material saving in renewal and repair expense can be effected if the original fastenings are absolutely secure and permanent. Therefore a decided advantage is claimed for the Star cable dog, as it will eliminate the use of all wood and other rotting and

easily destroyed substances. At the same time it can easily be taken down without injury, as the wedge may be loosened by pressure of a hammer or chisel, thus re-

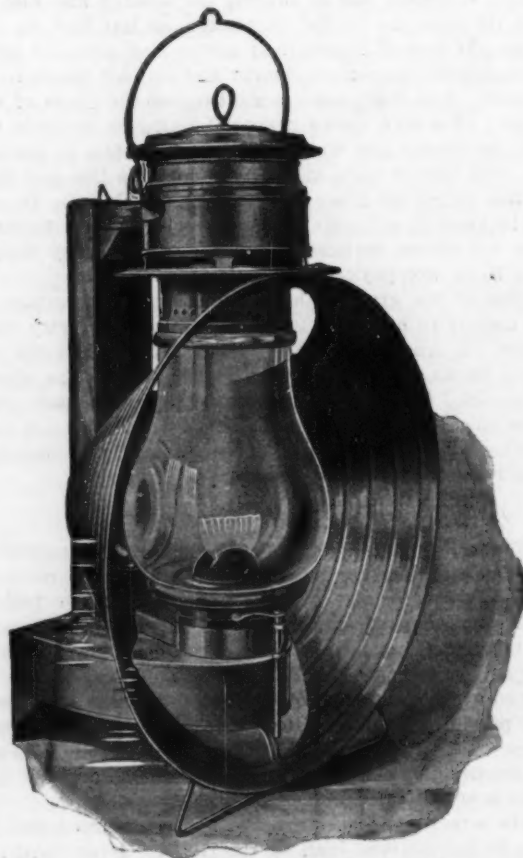


Star Cable Dog.

leasing the hold. It is made in four sizes to carry cable from $\frac{1}{2}$ to $2\frac{1}{4}$ inches in diameter. Shanks vary in length from $1\frac{1}{2}$ to 2 inches, according to the size.

Ham's No. 40 Mammoth Searchlight Lamp.

Among new goods recently put on the market by the C. T. Ham Mfg. Company, Rochester, N. Y., for whom John H. Graham & Co., 113 Chambers street, New York, are selling agents, is the No. 40 Mammoth searchlight



Ham's No. 40 Mammoth Searchlight Lamp.

lamp, illustrated herewith. This is a large lamp and gives a correspondingly large and brilliant light. It is especially suitable for use in warehouses, packing houses, picnic grounds, &c. The lamp is constructed on the company's cold blast principle, is made of the best material and is guaranteed to give satisfaction.

P. A. Myers of F. E. Myers & Bro., Ashland, Ohio, under date of the 13th inst. has been granted patents on improvements in hay rack clamps. With these clamps the farmer will be able to construct his own hay rack without the use of special tools or skill, only an ordinary wrench being necessary to place the clamps in position, the wooden frame of the rack being made from certain sizes of material specified in the printed matter sent out by the company.

Progress Universal Spraying Machine.

The illustration shows a new implement which has recently been placed on the market by the Dayton Supply Company, Dayton, Ohio. While adapted for several purposes, the machine is expected to appeal especially to mills, factories, foundries, &c., for applying whitewash and cold water paints in a rapid and efficient manner. It combines the various appliances necessary for the work it has to do, including tank, pump, hose, assorted



Progress Universal Spraying Machine.

nozzles and automatic agitator. The outfit is mounted on wheels, allowing of free movement from place to place. Each stroke of the pump handle operates the agitator as well, thus maintaining the proper consistency of the fluid in the tank. The machine comes in two sizes, holding 12 and 20 gallons, respectively, and is described as substantially made with a view to long wear and hard usage. In addition to the purposes mentioned the implement may also be used for applying disinfectants, for the destruction of insect pests and plant diseases and in the coreroms of foundries for the moistening of cores.

Rustic Garden Bordering.

The garden bordering illustrated herewith is manufactured by M. D. Jones & Co., 71-73 Portland street, Boston, Mass. The wickets are made of cast iron, bronzed, and are disconnected, which makes for cheapness, and affords an advantage for many purposes in

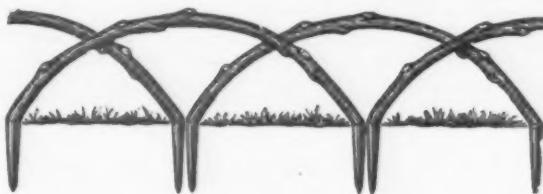


Fig. 1.—Rustic Garden Bordering No. 2.

private grounds, parks and cemeteries. The heavy rustic wickets have the massiveness necessary to bring out certain effects of landscape gardening. The firm has systematized the sale of the bordering by tabulating the number of wickets required per 100 feet, thus making

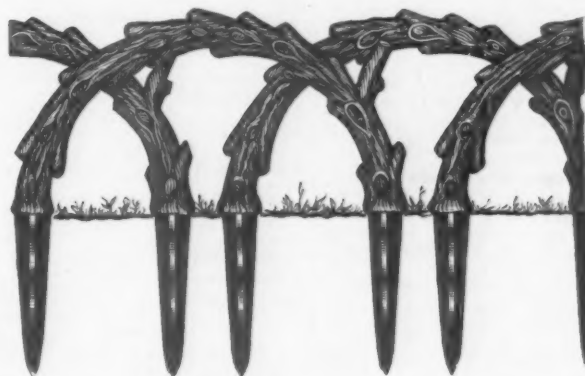


Fig. 2.—Rustic Garden Bordering No. 3.

it an easy matter for the salesmen to assist a customer in determining his wants, after being given the required length of bordering. Plain wrought iron wickets, painted green, are also made by the firm.

PAINTS, OILS AND COLORS

White Lead, Zinc, &c.—

Lead, English white, in Oil.....	9 1/2 @ 9 1/4
Lead, American white, in Oil:	
Lots of 500 lb or over.....	@ 6 1/2
Lots less than 500 lb.....	@ 7
In Barrels.....	@ 6
Lead, White, in oil, 25 lb tin	
pails, add to keg price.....	@ 1/2
Lead, White, in oil, 12 1/2 lb tin	
pails, add to keg price.....	@ 1
Lead, White, in oil, 1 to 5 lb	
ass't tins, add to keg price.....	@ 1 1/2
Lead, American, Terms: For lots 12	
tons and over 1/4% rebate; and 2% for	
cash if paid in 15 days from date of	
invoice; for lots of 500 lbs. and over	
2% for cash if paid in 15 days from	
date of invoice, for lots of less than	
500 lbs. net.....	@ 6
Lead, White, Dry in bbls.....	@ 6
Zinc, American, dry.....	4 1/2 @ 4 1/4
Zinc, French:	
Paris, Red Seal, dry.....	8 1/4
Paris, Green Seal, dry.....	9 1/4
Antwerp, Red Seal, dry.....	7 1/4
Antwerp, Green Seal, dry.....	8 1/4
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over.....	11 1/2 @ 12 1/4
Lots of less than 1 ton.....	11 1/2 @ 12 1/4
Discounts—French—Discounts	
to buyers of 10 bbl. lots of one or mixed	
grades, 1%; 25 bbls., 2%; 50 bbls., 4%.	

Dry Colors—

Black, Carbon.....	5 @ 10
Black, Drop, Amer.....	4 @ 6
Black, Drop, Eng.....	4 @ 15
Black, Ivory.....	16 @ 20
Lamp, Com.....	4 1/2 @ 6
Blue, Celestial.....	4 @ 6
Blue, Chinese.....	29 @ 32
Blue, Prussian.....	27 @ 30
Blue, Ultramarine.....	4 1/2 @ 15
Brown, Spanish.....	1 1/2 @ 2
Carmine, No. 40.....	3 1/2 @ 5 @ 6
Green, Chrome, ordinary.....	3 1/2 @ 6

Green, Chrome, pure.....	17 @ 25
Lead, Red, bbls., 1/2 bbls. and kegs:	
Lots 500 lb or over.....	@ 6 1/2
Lots less than 500 lb.....	@ 7
Litharge, American, bbls.....	6 @ 6 1/2
Ocher, American.....	@ ton \$8.50 @ 16.00
Orcher, American Golden.....	2 1/2 @ 3 1/4
Orcher, French.....	1 1/2 @ 2 1/4
Orcher, Foreign Golden.....	3 @ 4
Orange Mineral, English.....	8 @ 10
Orange Mineral, French.....	10 1/2 @ 11 1/4
Orange Mineral, German.....	7 1/2 @ 10
Orange Mineral, American.....	8 @ 8 1/4
Red, Indian, English.....	4 1/2 @ 5 1/4
Red, Indian, American.....	3 @ 3 1/4
Red, Turkey, English.....	4 @ 10
Red, Tuscan, English.....	7 @ 10
Red, Venetian, Amer.....	@ 100 lb \$0.50 @ 1.25
Red, Venetian, English.....	@ 100 lb \$1.15 @ 1.75
Sienna, Italian, Burnt and	
Powdered.....	3 @ 9 1/4
Sienna, Ital., Raw, Powd.....	3 @ 6 1/2
Sienna, American, Burnt and	
Powdered.....	1 1/2 @ 2
Talc, French.....	@ ton \$15.00 @ 20.00
Talc, American.....	@ ton 15.00 @ 25.00
Terra Alba, French.....	@ 100 lb 90 @ 1.00
Terra Alba, English.....	@ 100 lb 90 @ 1.00
Terra Alba, American.....	@ 100
No. 1.....	50 @ 70
No. 2.....	45 @ 50
Umber, T'key, Bnt. & Pow.....	2 1/2 @ 3 1/4
Umber, Turkey, Raw & Pow.....	2 1/2 @ 3 1/4
Umber, Burnt, Amer.....	1 1/2 @ 2
Umber, Raw, Amer.....	1 1/2 @ 2
Yellow, Chrome.....	13 @ 14
Vermilion, American Lead.....	10 @ 25
Vermilion, Quicksilver, bulk.....	@ 25
Vermilion, Quicksilver, bags.....	@ 25
Vermilion, English, Import.....	75 @ 80
Vermilion, Chinese.....	\$0.90 @ 1.00

Colors in Oil—

Black, Lampblack.....	12 @ 14
Blue, Chinese.....	26 @ 24
Blue, Prussian.....	23 @ 26
Blue, Ultramarine.....	13 @ 16
Brown, Van Dyke.....	11 @ 14
Green, Chrome.....	19 @ 25
Green, Paris.....	19 @ 24

Sienna, Raw.....	12 @ 15
Sienna, Burnt.....	12 @ 15
Umber, Raw.....	11 @ 14
Umber, Burnt.....	11 @ 14

Miscellaneous—

Barytes, White, Foreign.....	@ ton \$17.50 @ 19.00
Barytes, Amer. floated.....	@ ton 18.00 @ 19.00
Barytes, Crude, No. 1.....	@ ton 10.00 @ 11.00
Chalk, in bulk.....	@ ton 3.00 @ 3.25
Chalk, in bbls.....	@ 100 lb @ .35
China Clay, English.....	@ ton 11.00 @ 17.00
Cobalt, Oxide.....	@ 100 lb 2.50 @ 2.60
Whiting, Common.....	@ 100 lb .43 @ .48
Whiting, Gilders.....	@ 100 lb .50 @ .55
Whiting, Ex. Gilders.....	@ 100 lb .55 @ .60

Putty, Commercial—

In bladders.....	\$1.75 @ 1.80
In bbls. or tubs.....	1.10 @ 1.15
In 1 lb to 5 lb cans.....	2.05 @ 2.95
In 12 1/2 to 50 lb cans.....	1.45 @ 1.60

Spirits Turpentine—

In Oil bbls.....	63 @ 63 1/4
In machine bbls.....	63 1/2 @ 64

Glue—

Cabinet.....	11 @ 15
Common Bone.....	7 @ 9
Extra White.....	12 @ 18
Foot Stock, White.....	11 @ 14
Foot Stock, Brown.....	8 @ 11
German Hide.....	12 @ 18
French.....	12 @ 18
Irish.....	13 @ 16
Low Grade.....	9 @ 12
Medium White.....	14 @ 17

Gum Shellac—

Bleached Commercial.....	31 @ 32
Bone Dried.....	42 @ 43
Button.....	36 @ 45
Diamond I.....	50 @ 52
Fine Orange.....	40 @ 45
A. C. Garnet.....	33 @ 34
D. C.....	66 @
Octagon B.....	33 @ 34
T. N.....	33 @ 34
V. S. O.....	46 @

Animal, Fish and Vegetable Oils—

Linseed, City, raw.....	50 @ 51
Linseed, City, boiled.....	52 @ 53
Linseed, State and West'n, raw.....	48 @ 49
Linseed, raw Calcutta seed.....	@ 50
Lard, Prime, Winter.....	57 @ 58
Lard, Extra No. 1.....	47 @ 48
Cotton-seed, Crude, f.o.b. mills.....	21 1/2 @ 22
Cotton-seed, Summer Yellow,	
Prime.....	27 1/2 @ 28
Cotton-seed, Summer Yellow,	
off grades.....	@
Sperm, Crude.....	55 @
Sperm, Natural Spring.....	@
Sperm, Bleached Spring.....	@
Sperm, Natural Winter.....	60 @ 63
Sperm, Bleached Winter.....	63 @ 65
Tallow, Prime.....	51 @ 53
Whale, Crude.....	@
Whale, Natural Winter.....	42 @ 44
Whale, Bleached Winter.....	44 @ 46
Menhaden, Brown, Strained.....	28 @ 29
Menhaden, Light, Strained.....	29 @ 30
Menhaden, Bleached, Winter.....	31 @ 32
Menhaden, Ex-Bld. Winter.....	32 @ 33
Menhaden, Southern.....	16 1/2 @ 17
Cocanut, Ceylon.....	@ lb 5 1/4 @ 6 1/4
Cocanut, Coch.....	@ lb 7 1/4 @ 7 1/2
Cod, Domestic, Prime.....	34 @ 36
Cod, Newfoundland.....	30 @ 31
Red Elaine.....	29 @ 32
Red, Saponified.....	@ lb 3 1/4 @ 4 1/4
Olive Italian, bbls.....	54 @ 57
Neatsfoot, prime.....	49 @ 50
Palm, Logos.....	@ lb 5 1/4 @ 5 1/2

Mineral Oils—

Black, 29 gravity, 55° cold.....	@ gal. 10 1/4 @ 11 1/4
Black, 29 gravity, 15 cold test.....	11 1/4 @ 12 1/4
Black, Summe.....	10 1/4 @ 11 1/4
Cylinder, light filtered.....	18 @ 19
Cylinder, dark filtered.....	16 @ 17
Paraffine, 90-97 gravity.....	12 1/2 @ 13
Paraffine, 93 gravity.....	11 1/4 @ 12
Paraffine, 95 gravity.....	9 1/4 @ 9 1/2
Paraffine, Red.....	11 1/2 @ 13
In small lots 1/4¢ advance.	

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33 $\frac{1}{2}$ %, @ 33 $\frac{1}{2}$ %, & 10% signifies

that the price of the goods in question ranges from 33 $\frac{1}{2}$ per cent. discount to 33 $\frac{1}{2}$ %, and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, $\frac{1}{2}$ doz. \$3.00.....33 $\frac{1}{2}$ %
North's.....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—American—

Eagle Anvils.....@ 10 7 $\frac{1}{2}$ to 7 $\frac{1}{2}$ %
Hay-Budden, Wrought.....@ 9 $\frac{1}{2}$ %
Horseshoe brand, Wrought.....@ 9 $\frac{1}{2}$ %
Trenton.....@ 10 9 $\frac{1}{2}$ %

Imported—

Peter Wright & Sons.....@ 10 10 $\frac{1}{2}$ %
Anvil, Vise and Drill—
Millers Falls Co., \$18.00.....15 & 19%

Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths'—

Livingston Nail Co.....33 $\frac{1}{2}$ %

Augers and Bits—

Com. Double Spur.....70 & 10%
Jennings' Patn. reg. Finish 50 & 10%
Boring Mach. Augers.....70 & 10%
Car Bits, 12-in. twist.....50 & 10%
Ford's Auger and Car Bits.....10 & 5%
Forster Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list.....25%
No. 30, R. Jennings' list.....40 & 7 $\frac{1}{2}$ %
Russell Jennings.....25 & 10 2 $\frac{1}{2}$ %
L'Houmedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....25 & 10%
Ohio Tool Co.'s: Auger and Car Bits.....40 & 10%
Pugh's Black.....20%
Pugh's Jennings Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....50%
Snell's Car Bits, 12-in. twist.....60 & 10%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's small, \$18, large, \$35.....50 & 10%
Clark's Pattern, No. 1, $\frac{1}{2}$ doz. \$35.....35%
No. 2, \$18.....50 & 10%
Ford's, Clark's Pattern.....50 & 10%
C. E. Jennings & Co., Steer's Pat.....25%
Swan's.....60%

Gimlet Bits—

Common Dble. Cut.....@ 33.00 @ 2.25
German Pattern, Nos. 1 to 10,
\$4.60; 11 to 13, \$5.75

Hollow Augers—

Bonney Pat., per doz. \$9.00 @ 10.00
Ames.....25 & 10%
New Patent.....25 & 10%
Universal.....20%
Wood's Universal.....20%

Ship Augers and Bits—

Ford's.....33 & 65%
C. E. Jennings & Co.:
L'Houmedieu's.....15%
Watrous'.....35 & 5%
Ohio Tool Co.'s.....40%
Snell's.....40%

Awl Hatts—See Hatts, Awl.

Awls—

Lead Awls:
Handled.....gro. \$2.75 @ 3.00
Unhdd, Shldered.....gro. 63 @ 66¢
Unhdd, Patent.....gro. 66 @ 70¢

Peg Awls—

Unhdd, Patent.....gro. 31 @ 34¢
Unhdd, Shldered.....gro. 65 @ 70¢

Scratch Awls—

Handled, Com.....gro. \$3.50 @ 4.00
Handled, Socket.....gro. \$11.50 @ 12.00
Hurwood.....40%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

Single Bit, base weights. (up to 3 $\frac{1}{2}$ lb.)
First Quality.....\$6.50
Second Quality.....\$6.00

Axle Grease—

See Grease, Axle

Axles—

Concord, Loose Collar.....@ 4 $\frac{1}{2}$ @ 4 $\frac{1}{2}$ %
Concord, Solid Collar.....@ 4 $\frac{1}{2}$ @ 4 $\frac{1}{2}$ %
No. 1 Common, Loose.....3 $\frac{1}{2}$ @ 3 $\frac{1}{2}$ %

No. 1 $\frac{1}{2}$ Com., New Style 3 $\frac{1}{2}$ @ 4 $\frac{1}{2}$ %
No. 2 Solid Collar.....@ 4 $\frac{1}{2}$ @ 4 $\frac{1}{2}$ %
Nos. 7, 8, 11 and 12.....75 @ 75¢
Nos. 13 to 14.....70 & 10 @ 75¢
Nos. 15 to 18.....75 & 10 @ 75¢
Nos. 19 to 22.....75 & 10 @ 75¢

Boxes, Axle—

Common and Concord, not turned
lb. 1 $\frac{1}{2}$ @ 6¢

Common and Concord, turned,
lb. 5 $\frac{1}{2}$ @ 6¢

Half Patent.....lb. 8 $\frac{1}{2}$ @ 9¢

Bait—

Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20 & 5%

Balances—

Sash—

Caldwell new list.....50%
Fullman.....50 & 10 50%

Spring—

Spring Balances.....60 @ 60 & 63%

Chatillon's:
Eight Spg. Balances.....40 & 10%

Straight Balances.....40%

Circular Balances.....50%

Large Dial.....30%

Barb Wire—See Wire, Barb.

Bars—

Crow—

Steel Crowbars, 10 to 40 lb.
per lb. 2 $\frac{1}{2}$ @ 3 $\frac{1}{2}$ %

Towel—

No. 10 Ideal, Nickel Plate.....@ gro. \$8.50

Beams, Scale—

Scale Beams.....40 & 10 @ 50%

Chatillon's No. 1.....30%

Chatillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered $\frac{1}{2}$ doz. \$0.85;
Tinned.....\$1.00

No. 11 Wire Coppered $\frac{1}{2}$ doz. \$1.10

Tinned.....\$1.20

No. 10 Wire Galvanized.....@ doz. \$1.75

Western W. G. Co.:
No. 1 Electric.....@ gro. \$7.80

No. 2 Buffalo.....@ gro. \$9.00

No. 3 Perfection Dust.....@ gro. \$8.00

Egg—

Holt-Lyon Co.:
Holt, No. A, Japanned.....@ doz. \$1.25

Holt, No. 1, Tinned.....@ doz. \$1.50

Holt, No. B, Japanned.....@ doz. \$2.00

Holt, No. 2, Tinned.....@ doz. \$2.25

Lyon, No. 2, Japanned.....@ doz. \$1.25

Lyon, No. 3, Japanned.....@ doz. \$1.50

Taplin Mfg. Co.:
No. 60 Improved Dover.....@ gro. \$6.00

No. 75 Improved Dover.....@ doz. \$6.50

No. 100 Improved Dover.....@ doz. \$7.00

No. 102 Improved Dover, Tin'd.....@ doz. \$8.50

No. 150 Improved Dover, Hotel.....@ doz. \$15.00

No. 192 Imp'd Dover, Hotel, T'd.....@ doz. \$17.00

No. 200 Imp'd Dover Tumbler.....@ doz. \$8.50

No. 202 Imp'd Dover Tumbler, T'd.....@ doz. \$9.50

No. 300 Imp'd Dover Mammoth.....@ doz. \$25.00

Western W. G. Co., Buffalo.....@ doz. \$7.00

Wonder (S. S. & Co.), $\frac{1}{2}$ gro. net, \$6.00

Bellows—

Blacksmith, Standard List.....60 & 10 @ 70 & 10%

Blacksmiths'—

Inch. 30 32 34 36 38 40
Each \$3.25 3.50 4.00 4.50 5.00 5.75

Extra Length:
Each \$3.75 4.25 4.75 5.25 6.00 7.00

Hand—

Inch. 6 7 8 9 10
Doz. \$4.50 5.00 5.50 6.00 6.39

Molders—

Inch. 9 10 11 12 14
Doz. \$8.00 9.00 10.50 12.50 14.50

Bells—

Cow—

Ordinary goods.....75 & 10 @ 75 & 10 45%
High grade.....70 & 10 @ 70 & 10 45%
Jersey.....75 & 10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55 & 10%
Lever and Pull, Bargent's.....60 & 10 & 10%
Trip Gong.....50 & 10 @ 50 & 10 45%
Yanket Gong.....35%

Hand—

Hand Bells, Polished, Brass.....60 & 10 @ 60 & 10 45%
White Metal.....60%

Nickel Plated.....50 & 10 @ 50 & 10 45%
Scales.....60 @ 60 & 75%
Cone's Globe Hand Bells.....33 & 35%
Silver China.....35 @ 35%

Miscellaneous—

Farm Bells.....lb. 2 $\frac{1}{2}$ @ 4¢

Steel Alloy Church and School.....50 & 10 @ 60 & 65%

American Tube & Stamping Co.
Gonga.....75%

Table Call Bells.....50 @ 50 & 10%

Belting—

Leather—

Extra Hoy, Short Lap.....60 @ 60 & 45%

Regular Short Lap.....65 & 10 @ 70%

Standard.....70 & 5 @ 70 & 10%

Light Standard.....70 & 10 @ 75%

Cut Leather Lacing.....60 & 10%

Leather Lacing Slides, per sq. ft.
17 $\frac{1}{2}$ @ 18¢

Rubber—

Agricultural (Low Grade).....75 @ 75 & 45%

Common Standard.....70 @ 70 & 10%

Standard.....65 & 10%

Extra.....60 & 5 @ 60 & 10%

High Grade.....50 & 5 @ 50 & 10%

Bench Stops—

See Stops, Bench

Benders and Upsetters,

Tire—

Detroit Perfected Tire Bender.....40%

Green River Tire Benders and Upsetters.....30%

Detroit Stockard's Lightning Tire Upsetters, No. 1, \$1.25; No. 2, \$1.25;
No. 3, \$1.50; No. 4, \$1.65; No. 5, \$2.50.

Bicycle Goods—

John S. Lang's Son's 1902 list:
Chain.....60%

Parts.....50%

Spokes.....50%

Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Blocks—

Tackle—

Common Wooden.....70 & 10 @ 75 & 45%

Hartz St. Tackle Blocks.....50 & 5 & 5%

Hollow Steel Blocks, with Ford's Patent Sheaves.....50 & 10%

Lane's Patent Automatic Lock and Junior.....30%

Stowell's Novelty, Mal. Iron.....50 & 10%

Stowell's Self Loading.....60%

See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....30 & 19 @ 40 & 10%

Boards, Wash—

See Washboards.

Bobs, Plumb—

Keuffel & Esser Co.....33 $\frac{1}{2}$ %

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):
 $\frac{1}{2}$ x 6 and smaller.....75 & 10%

Larger and longer.....70 & 7 $\frac{1}{2}$ %

Phila. Eagle \$3.00 list May 21, '99

Bolt Ends, list Feb. 13, '95.....70 & 2 $\frac{1}{2}$ %

Machine, $\frac{1}{2}$ x 4 and smaller.....75 & 2 $\frac{1}{2}$ %

Machine, larger and longer.....70 & 45%

Door and Shutter—

Cast Iron Barrel, Japanned,
Round Brass Knob:
Inch. 3 4 5 6 8
Per doz. \$0.30 35 45 55 75

Cast Iron Spring Foot, Jap'd:
Inch. 6 8 10
Per doz. \$1.15 1.40 2.00

Cast Iron Chain, Flat, Japanned:
Inch. 6 8 10
Per doz. \$0.95 1.25 1.55

Cast Iron Shutter, Japanned,
Brass Knobs:
Inch. 6 8 10
Per doz. \$0.80 90 1.20

Wrt Barrel Jap'd.....80 @ 80 & 10%

Wrt.....Bronzed.....50 @ 50 & 10%

Wrt. Spring.....70 & 10 @ 70 & 10 45%

Wrt. Shutter.....50 & 5 @ 50 & 10 45%

Wrt. Square Neck.....75 @ 75 & 10%

Wrt Square.....65 & 10 @ 65 & 10 45%

Ices' Patent Door.....60%

Plow and Stove—

Plow.....65 & 10 @ 65 & 10 45%

Stove.....82 $\frac{1}{2}$ @ 10 @ 82 $\frac{1}{2}$ & 10 45%

Tire—

Common.....80%

Norway Iron.....80%

American Screw Company:
Norway Phila., list Oct. 16, '94.....80%

Eagle Phila., list Oct. 16, '94.....82 $\frac{1}{2}$ %

Bay State, list Dec. 23, '99.....80%

Franklin Moore Co.:
Norway Phila., list Oct. 16, '94.....80%

Eagle Phila., list Oct. 16, '94.....82 $\frac{1}{2}$ %

Belphie, list Dec. 23, '99.....80%

Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '94.....80%

Eagle Phila., list Oct. 16, '94.....82

Faucets—

Cork Lined.....	50¢@60¢10%
Metallic Key, Leather Lined.....	60¢10¢70%
Red Cedar.....	40¢10¢50%
Petroleum.....	70¢10¢75%
B. & L. B. Co.:.....	
Metal Key.....	60¢10%
Star.....	60%
West Lock.....	50¢10%
John Sommer's Peerless Tin Key.....	50%
John Sommer's Boss Tin Key.....	50%
John Sommer's Victor Mtl. Key.....	50¢10%
John Sommer's Duplex Metal Key.....	60%
John Sommer's Diamond Lock.....	40%
John Sommer's I. X. L. Cork Lined.....	50%
John Sommer's Reliable Cork Lined.....	50¢10%
John Sommer's Chicago Cork Lined.....	50%
John Sommer's O. K. Cork Lined.....	50%
John Sommer's No Brand, Cedar.....	50%
John Sommer's Perfection, Cedar.....	40%
McKenna, Brass.....	50%
Burglar Proof, N. P.....	55%
Improved, 1/4 and 1/2 inch.....	55%
Self Measuring.....	40¢10%
Enterprise, 1/2 doz. \$36.00.....	40¢10%
Lane's, 1/2 doz. \$36.00.....	40¢10%
National Measuring, 1/2 doz. \$36.00.....	40¢10%

Felloe Plates—

See Plates, Felloe.

Files— Domestic—

List revised Nov. 1, 1899.

Best Brands.....	70¢10¢75¢5%
Standard Brands.....	75¢10¢75¢10¢10%
Lower Grade.....	75¢10¢10¢80¢10%

Imported—

Stubs' Tapers, Stubs' list, July 21, '97.....	33 1-3¢10%
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Fixtures, Fire Door—

Richards Mfg. Co.:.....	
Universal, No. 103.....	\$4.00
Special, No. 104.....	\$4.00
Fusible Links.....	\$0.25
Expansion Bolts.....	50¢10%

Grindstone—

Net Prices:	
Inch.....	15 17 19 21 24
Per doz. \$2.15 2.85 3.25 3.75 4.50	
P. S. & W. Co.....	30¢10¢40%
Reading Hardware Co.....	70%
Sargent's.....	70%
Stowell's Giant Grindstone Hanger.....	1/2 doz. \$6.00
Stowell's Grindstone Fixtures, Extra Heavy.....	50¢10¢10%
Stowell's Grindstone Fixtures, Light.....	60¢10%

Fodder Squeezers—

See Compressors.

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Bay Potato.....	60¢10%
Victor, Hay.....	60¢15¢24%
Victor, Header.....	65%
Champion, Hay.....	65%
Champion, Header.....	65%
Champion, Manure.....	60¢15¢24%
Columbia, Hay.....	60¢20%
Columbia, Manure.....	70%
Columbia, Spading.....	70¢12%
Hawkeye Wood Barley.....	40%
W. & C. Potato Digger.....	60¢10%
Acme Hay.....	60¢20%
Acme Manure, 4 line.....	60¢10¢5%
Dakota Header.....	60¢20%
Jackson Steel Barley.....	60¢20%
Kansas Header.....	65%
W. & C. Favorite Wood Barley.....	40%
Plated.—See Spoons.	

Frames— Saw—

White, S'g't Bar, per doz. 75¢80¢	
Red, S'g't Bar, per doz. \$1.00¢1.25	
Red, Dbl. Brace, per doz. \$1.40¢1.50	

Freezers, Ice Cream—

Qt.	1 2 3 4 6
Each.....	\$1.30 \$1.60 \$1.90 \$2.20 \$2.80

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.**Fuse—**

Per 1000 Feet.

Hemp.....	\$2.75
Cotton.....	3.20
Waterproof Sgl. Taped.....	3.65
Waterproof Dbl. Taped.....	4.40
Waterproof Tpl. Taped.....	5.15

Gates, Molasses and Oil—

Stebbins' Pattern.....	80¢10¢80¢10¢45%
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Gauges—

Marking, Mortise, &c.....	50¢10¢50¢10¢10¢45%
Chapin-Stephens Co.:.....	
Marking, Mortise, &c.....	50¢10¢50¢10¢10¢45%
Scholl's Patent.....	50¢10¢50¢10¢10¢45%
Door Hangers.....	50¢10¢10%
Stanley R. & L. Co.'s Butt and Rabbit Gauge.....	35%
Marking and Mortise.....	60%
Wire, Brown & Sharpe's.....	25%
Wire, Morse's.....	25%
Wire, P. S. & W. Co.....	30¢10%

Gimlets— Single Cut—

Numbered assortments, per gro.

Nail, Metal, No. 1, \$2.00; 2, \$2.30	
Spike, Metal, No. 1, \$4.00; 2, \$4.30	
Nail, Wood Handled, No. 1, \$2.30; 2, \$2.60	
Spike, Wood Handled, No. 1, \$4.30; 2, \$4.60	

Glass, American Window

See Trade Report.

Glasses, Level—

Chapin-Stephens Co.....	60¢10¢10¢10%
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Glue, Liquid Fish—

Bottles or Cans, with Brush.....	25¢50%
Cans (1/4 pts., pts., qts., 1/2 gal., gal.).....	25¢10%
International Glue Co. (Martin's).....	40¢10%

Grease, Axle—

Common Grade.....	gro. \$4.50¢5.50
Dixon's Everlasting, 10-lb pails, ea. 85¢	
Dixon's Everlasting, in boxes, 1/2 doz. 1 lb. \$1.20; 2 lb. \$2.00	

Grips, Nipple—

Perfect Nipple Grips.....	40¢10¢2%
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Griddles, Soapstone—

Pike Mfg. Co.....	33¢10¢33¢10%
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Grindstones—

Bicycle Emery Grinder.....	\$6.50
Bicycle Grindstones, each.....	\$2.50¢3.00
Pike Mfg. Co.:.....	
Improved Family Grindstones, per inch, 1/2 doz.....	\$2.00
Pike Mower and Tool Grinder.....	\$6.00
Velox Ball Bearing, Mounted, Angle Iron Frames, each.....	\$3.25

Halters and Ties—

Covert Mfg. Co.:.....	
Web.....	35¢45%
Jute Rope.....	50%
Sisal Rope.....	30¢10%
Cotton Rope.....	45%
Hemp Rope.....	45%
Covert's Saddlery Works:.....	
Web and Leather Halters.....	70%
Jute and Manila Rope Halters.....	70%
Sisal Rope Halters.....	30%
Jute, Manila and Cotton Rope Ties.....	70%
Sisal Rope Ties.....	60¢10%
E. T. Rug & Co.:.....	
Leather Halters.....	50%
Web Halters and Webbing.....	60%
Jute and Sisal Rope Halters.....	60%
Jute and Sisal Horse and Cattle Ties.....	60%
Cotton Horse Ties.....	60%
Livery Ties, Braided.....	60%

Hammers—**Handled Hammers—**

Heller's Machinists'.....	40¢10¢40¢10¢10%
Heller's Farriers.....	40¢10¢40¢10¢10%
Magnetic Tack, Nos. 1, 2, 3, 11, 25, \$1.50, \$1.75.....	40¢10¢5%
Peck, Stow & Wilcox.....	40¢10¢5%
Fayette R. Plumb:.....	
Plumb, A. E. Nail.....	33¢4¢7¢10¢33¢4¢10¢10%
Engineers' and B. S. Hand.....	50¢7¢10¢50¢10¢7¢10%
Machinists' Hammers.....	50¢5¢60¢10¢5%
Riveting and Timbers.....	40¢2¢40¢10¢10%
Sargent's C. B. New List.....	40%

Heavy Hammers and Sledges—

Under 3 lb., per lb. 50¢.....	80¢10¢10¢85%
3 to 5 lb., per lb. 40¢.....	80¢10¢10¢85%
Over 5 lb., per lb. 30¢.....	85¢95¢10%
Wilkinson's Smiths'.....	1 lb. 9¢10¢10%

Handles—**Agricultural Tool Handles**

Axe, Pick, &c.....	60¢5¢60¢10¢45%
Hoe, Rake, &c.....	45¢50¢45%
Fork, Shovel, Spade, &c.:.....	
Long Handles.....	45¢50¢45%
D Handles.....	40%

Cross-Cut Saw Handles—

Atkins'.....	40¢5%
Champion.....	45¢45¢10%
Diston's.....	50%

Mechanics' Tool Handles—

Auger, assorted.....	gro. \$2.50¢\$2.85
Brad Axl.....	gro. \$1.65¢\$1.85

Chisel Handles:—

Apple Tanged Firmer, gro. assorted.....	\$2.40¢\$2.65
Hickory Tanged Firmer, gro. assorted.....	\$2.15¢\$2.40
Apple Socket Firmer, gro. assorted.....	\$1.75¢\$1.95
Hickory Socket Firmer, gro. assorted.....	\$1.45¢\$1.60
Hickory Socket Framing, gro. assorted.....	\$1.60¢\$1.75
File, assorted.....	gro. \$1.30¢\$1.50
Hammer, Hatchet, Axe, &c.....	60¢10¢60¢10¢10%
Hand Saw, Varnished, doz. 80¢85¢; Not Varnished.....	65¢75¢

Plane Handles:—

Jack, doz. 30¢; Jack, Bolted 75¢	
Fore, doz. 45¢; Fore, Bolted 90¢	
Chapin-Stephens Co.:.....	
Carving Tool.....	40¢40¢10%
Chisel.....	65¢65¢10%
File and Awl.....	65¢65¢10%
Saw and Plane.....	40¢40¢10%
Millers Falls Adj. and Hatchet Auger Handles.....	15¢10%
Nicholson Simplicity File Handle.....	1/2 gro. \$0.85¢\$1.50

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c

Barn Door, New Pattern, Round

Groove, Regular:	
Inch.....	3 4 5 6 8
Single Dsz.....	\$0.90 1.25 1.60 1.95 2.50

Barn Door, New England Pat-

tern, Check Back, Regular:

Inch.....	3 4 5 6
Single Dsz.....	\$1.30 1.85 2.50 3.00
Alth. Mfg. Co.:.....	
Reliable, No. 1.....	per doz. \$3.00
Reliable, No. 2.....	per doz. \$0.60
Chicago Spring Butt Co.:.....	
Friction.....	25%
Oscillating.....	25%
Big Twin.....	25%
Chasmo Moore Mfg. Co.:.....	
Baggage Car Door.....	50%
Elevator.....	30%
Railroad.....	50%
Crunk & Carrier Mfg. Co.:.....	
Loose Axle.....	60¢10¢5%
Roller Bearing.....	70¢45%
Griffin Mfg. Co.:.....	
Solid Axle, No. 10.....	\$12.00
Roller Bearing, No. 11.....	\$15.00
Roller Bearing, Ex. Hy., No. 12.....	\$18.00
Hinged Hangers.....	\$14.00
Lane Bros.:.....	
Parlor, Ball Bearing.....	\$4.00
Parlor, Standard.....	\$3.15
Parlor, No. 105.....	\$2.85
Parlor, New Model.....	\$2.80
Parlor, New Champion.....	\$2.25
Barn Door, Standard.....	60¢10%
Hinged.....	net \$6.40
Covered.....	60¢10%
Special.....	70¢45%
Lawrence Bros.:.....	
Advance.....	60¢10%
Hammer.....	70¢45%
Clipper, No. 75.....	60%
Crown.....	60¢10%
Easy Parlor Door, Dbl. Sets, \$2.50; Single Sets, \$1.25.....	60¢45%
Giant.....	60¢45%
Hammer.....	60¢45%
New York.....	60¢45%
Peerless.....	70¢45%
Sterling.....	60¢10%
McKinney Mfg. Co.:.....	
No. 1, Special, \$15.....	60¢10%
No. 2, Standard, \$12.....	60¢10%
Hinged Hangers, \$15.....	60%
Meyers' Stayon Hangers.....	60%
Richards Mfg. Co.:.....	
Pioneer Wood Track No. 3, \$2.15	
Ball B'r's St'l Track No. 10, \$2.40	
Roller B'r's St'l Track No. 12, \$2.30	
Ball B'r's St'l Track No. 13, \$2.40	
Roller B'r's St'l Track No. 14, \$2.30	
Hero, Adj. Track No. 19.....	50%
Adjustable Track Tandem Trolley Track No. 18.....	50%
Seal, Steel Track No. 8.....	\$2.40
Auto Hdg. Track No. 25.....	40¢10%
Trolley B. D. No. 17.....	\$1.40
Trolley F. D. No. 120.....	\$2.35
Trolley F. D. No. 121.....	\$2.45
Trolley F. D. No. 150.....	\$2.60
Safety Underwriters F. D. No. 122.....	\$2.25
Tandem No. 10.....	70¢45%
Trolley F. D. No. 151.....	\$3.00
Pioneer, Adjustable Track No. 132.....	40¢10%
Royal, Adjustable Track No. 123.....	40¢10%
Ives Wood Track No. 1.....	\$1.15
Trolley B. D. No. 20.....	\$1.35
Trolley B. D. No. 21.....	\$1.45
Trolley B. D. No. 27.....	\$1.50
Trolley B. D. No. 28.....	\$1.66
Roller Bearings Nos. 39, 40, 41.....	\$4.00
Anti-friction No. 42.....	60¢10%
Hinged Tandem No. 43.....	60%
Folding Door B. B. Swivel No. 135.....	30%
Safety Door Hanger Co.:.....	
Sargent's Kicker.....	60%
U. S. Standard Hinge.....	60%
Stowell Mfg. & Foundry Co.:.....	
Acme Parlor Ball Bearing.....	40%
Ajax Hinge Door.....	60%
Apex Parlor Door.....	50¢10¢5%
Ajax Hinge Door.....	60%
Baggage Car Door.....	60%
Climax Anti-Friction.....	50¢10%
Elevator.....	40%
Express.....	50%
Freight Car Door.....	60%
Ingersoll's.....	60¢10%
Lundy Parlor Door.....	50¢10%
Magic.....	60%
Matchless.....	60¢10%
Nansen.....	70¢45%
Parlor Door.....	50¢10%
Railroad.....	50¢10%
Rice Hinge Door.....	50%
Street Car Door.....	50%
Steel, Nos. 300, 404, 500.....	50¢10%
Underwriters' Fire Door.....	40%
West Warehouse Door.....	50%
Zenith for Wood Track.....	50¢10%
A. L. Sweet's Iron Works:.....	
Check Back.....	70%
Climax Anti-Friction.....	50¢10%
Eagle.....	70%
Hylo Hinge.....	60%
New Perfection.....	60%
Pilot.....	60%
Rider Wooster.....	65%
Western Pattern.....	70%
Taylor & Boggs F'y Co.'s Kicker's Roller Bearing.....	50¢15¢10¢45%
Wilcox Mfg. Co.:.....	
Bike Roller Bearing.....	60¢10%
C. J. Roller Bearing.....	60¢10%
Cycle Ball Bearing.....	60%
Dwarf Ball Bearing.....	40%
Ives Wood Track.....	60¢10%
L. T. Roller Bearing.....	60¢10¢5%
New Era Roller Bearing.....	50¢10%
O. K. Roller Bearing.....	60¢10¢5%
Prindle Wood Track.....	60%
Richards' Steel Track.....	50¢10%
Spartan Roller Bearing.....	60¢10%
Tandem Nos. 1 and 2.....	60%
Underwriters' Roller Bearing.....	40%
Velvet.....	50%
Wilcox Auditorium Ball B'r's.....	50%
Wilcox Barn Trolley No. 123.....	40%
Wilcox Elev. Door, Nos. 112 and 122.....	40%
Wilcox Elev. Door No. 135.....	40%
Wilcox Fire Trolley, Roller Bearing.....	30%
Wilcox Le Roy Noiseless Ball Bearing.....	40%
Wilcox New Century.....	50¢10%
Wilcox O. K. Steel Track.....	50%
Wilcox O. K. Trolley.....	50%
Wilcox Trolley Ball Bearing.....	40%
Wilcox Wideman Narrow Gauge Ball Bearing.....	40%
For Track, see Rail.	

Hangers— Garment—

Pullman Trouser, 1/2 gro. No. 1, \$9.00; No. 4, \$24.00; No. 7, \$7.50.	
Victor Folding.....	1/2 gro. \$9.00
Western, W. G. Co.....	70¢10%

Sand and Emery—

Flint Paper and Cloth, 600 to 1000, 10¢
Garnet Paper and Cloth, 25¢
Emery Paper and Cloth, 50¢ to 100¢

Parers—Apple—

Advance 10 doz. \$4.00
Baldwin 10 doz. \$4.00
Bonanza Improved each \$6.50
Daisy 10 doz. \$4.00
Dandy 10 doz. \$4.00
Eureka Improved each \$2.00
Family Bay State 10 doz. \$15.00
Improved Bay State 10 doz. \$36.00
Little Star 10 doz. \$5.00
New Lightning 10 doz. \$7.00
Reading 72 10 doz. \$5.25
Rocking Table 10 doz. \$4.25
Turn Table 36 10 doz. \$4.00
White Mountain 10 doz. \$5.00

Potato—

Saratoga 10 doz. \$7.00
White Mountain 10 doz. \$6.00

Picks and Mattocks—

List Feb. 23, 1899, 70¢ to 75¢
Cronk's Handled Garden Mattock, 10 doz., \$6.40 33¢

Pinking Irons—

See Irons, Pinking.

Pins, Escutcheon—

Brass 60¢ to 10¢
Iron, list Nov. 11, '85, 60¢ to 10¢

Pipe, Cast Iron Soil—

Carload lots.
Standard, 2-6 in. 60¢
Extra Heavy, 2-4 in. 70¢
Fittings 75¢

Pipe, Merchant—

Carload Lots.
Steel.
1/4 & 1/2 in. 51¢
3/4 & 1 in. 59¢
1 to 6 in. 75¢
7 to 12 in. 70¢
Iron.
1/4 & 1/2 in. 65¢
3/4 & 1 in. 69¢
1 to 6 in. 73 1/2¢
7 to 12 in. 68 1/2¢

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 2 to 24 in.:
New England 68¢
New York and New Jersey 71¢
Maryland, Delaware, E. Pa. 75¢
West. Pa. and West Va. 71¢
Virginia 76¢
Ohio, Michigan and Ky. 77¢
Indiana 77¢
NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:
C. L. L. C. L.
5 in., per 100 joints \$7.00 \$8.00
6 in., per 100 joints 7.50 8.50
7 in., per 100 joints 8.50 9.50

Planes and Plane Irons—

Wood Planes—
Bench, first qual. 40¢ to 10¢
Bench, second qual. 50¢ to 10¢
Molding 33 1/2¢ to 10¢
Bailey's (Stanley R. & L. Co.) 40¢
Chapin-Stephens Co.:
Bench, first quality 40¢ to 10¢
Bench, second quality 50¢ to 10¢
Molding 33 1/2¢ to 10¢
Toy and German 60¢ to 10¢
Ohio Tool Co.:
Bench, first quality 40¢ to 10¢
Bench, second quality 50¢ to 10¢
Molding 33 1/2¢ to 10¢
Adjustable Wood Bottom 60¢
Union 60¢
Iron Planes—
Bailey's (Stanley R. & L. Co.) 40¢
Chapin's Iron Planes 50¢ to 10¢
Miscellaneous Planes (Stanley R. & L. Co.) 35¢
Ohio Tool Co.'s Iron Planes 60¢
Sargent's 60¢ to 10¢
Union 60¢

Plane Irons—

Wood Bench Plane Irons 25¢ to 10¢ to 30¢
Buck Bros. 30¢
Chapin-Stephens Co. 30¢ to 10¢
Ohio Tool Co. 35¢
Stanley R. & L. Co. 35¢
Union 50¢
L. & J. White 20¢ to 25¢

Planters, Corn, Hand—

Kohler's Eclipse 10 doz. \$8.50

Plates—

Felco 10 lb. 5¢ to 14¢
Self-Sealing Pie Plates (S. S. & Co.) 10 doz. \$2.00 50¢

Pliers and Nippers—

Button Pliers 75¢ to 10¢ to 80¢
Gas Burner, per doz. 5 in. \$1.25
Gas Pipe, 7 8 10 12 in. \$2.00 \$2.25 \$3.00 \$3.75
Acme Nippers 50¢ to 60¢
Cronk & Carrier Mfg. Co.:
American Button 75¢ to 10¢
Cronk's 60¢
Improved Button 60¢ to 10¢
Stub's Pattern 50¢
Combination and others 35¢
Heller's Pliers, Nippers, Pincers and Tools 40¢ to 10¢ to 10¢
P. S. & W. Timmers' Cutting Nippers 30¢ to 10¢
Swedish Side, End and Diagonal Cutting Pliers 50¢
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40¢

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels 30¢ to 10¢ to 10¢
Chapin's Imp. Brass Cor. 40¢ to 10¢ to 10¢
Pocket Levels 30¢ to 10¢ to 10¢
Dixson's Plumbs and Levels 70¢
Dixson's Pocket Levels 70¢

C. E. Jennings & Co.'s Iron 33 1/2¢
C. E. Jennings & Co.'s Iron, Adjustable 40¢ to 10¢
Stanley R. & L. Co. 45¢
Stanley's Duplex 35¢
Woods' Extension 35¢

Poachers, Egg—

Buffalo Steam Egg Poachers, 10 doz. No. 1, \$6.00; No. 2, \$5.00; No. 3, \$4.00; No. 4, \$12.00 50¢

Points, Glaziers—

Bulk and 1-lb. papers, 1 lb. 8 1/2¢ to 9 1/2¢
1/2-lb. papers 10¢ to 10 1/2¢
1/4-lb. papers 10¢ to 10 1/2¢

Pokes, Animal—

Ft. Madison Hawkeye 10 doz. \$3.25
Ft. Madison Western 10 doz. \$4.00

Police Goods—

Manufacturers' Lists 25¢ to 25¢ to 5¢

Polish—Metal, Etc—

Glasbrite, No. 2, 5 lb can (powder), each, \$1.25; 10 doz. \$12.00; No. 2, 10 lb can (cake), each, \$2.50; 10 doz. \$25.00.
Prestoline Liquid, No. 1, 1/2 qt. 1 lb. doz., \$3.00; No. 2 (1 qt.), \$2.75; 40¢
Prestoline Paste 40¢ to 10¢
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, 10 doz. \$5.00; 1 lb. boxes, 10 doz. \$2.25.
U. S. Liquid, 8 oz. cans, 10 doz., \$1.25; 10 doz. \$12.00.
Barkeepers' Friend Metal Polish, 10 doz. \$1.75; 10 doz. \$18.00.
Wynn's White Silk, 1/2 pt. cans, 10 doz. \$2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, 10 doz. \$1.00
Black Eagle, Liquid, 1/2 pt. cans, 10 doz. \$1.00
Black Jack Paste, 1/2 lb cans, 10 doz. \$9.00
Black Kid Paste, 5 lb cans, each, \$0.65
Ladd's Black Beauty, gr. \$10.00 50¢
Joseph Dixon's, 1 lb. gr. \$5.75 10¢
Dixon's Plumbago 10¢
Fireline 10¢
Gem, 10 gr. \$4.50 10¢
Japanese 10¢
Jet Black 10¢
Peerless Iron Enamel, 10 oz. cans, 10 doz. \$1.50

Wynn's:

Black Silk, 5 lb pail each 70¢
Black Silk, 1/2 lb box 10¢
Black Silk, 5 oz. box 10¢
Black Silk, 1/2 pt. liq. 10¢

Poppers, Corn—

1 qt., Square gro. \$9.00
1 qt., Round gro. \$10.00
1 1/2 qt., Square gro. \$11.00
2 qt., Square gro. \$13.00

Post Hole and Tree Augers and Diggers—

See also Diggers, Post Hole, &c.

Posts, Steel—

Steel Fence Posts, each, 5 ft., 4 1/2¢; 6 ft., 4¢; 8 ft., 4 1/2¢.
Steel Hitching Posts, each \$1.30

Potato Parers—

See Parers, Potato.

Pots, Glue—

Enamelled 40¢
Tinned 35¢

Powder—

In Canisters:
Duck, 1 lb. each 45¢
Fine Sporting, 1 lb. each 75¢
Rifle, 1/2 lb. each 15¢
Rifle, 1 lb. each 25¢
In Kegs:
12 1/2-lb. kegs \$2.50
25-lb. kegs \$4.50
King's Semi-Smokeless:
Keg (25 lb bulk) \$6.50
Half Keg (12 1/2 lb bulk) \$3.50
Quarter Keg (6 1/4 lb bulk) \$1.90
Case 24 (1 lb cans bulk) \$3.50
Half case (1 lb cans bulk) \$4.50
King's Smokeless:
Shot Gun Rifle:
Keg (25 lb bulk) \$12.00 \$15.00
Half Keg (12 1/2 lb bulk) 6.25 7.75
Quarter Keg (6 1/4 lb bulk) 3.25 4.00
Case 24 (1 lb cans bulk) 14.00 17.00
Half case 12 (1 lb c. bk.) 7.25 8.75
Robin Hood Sm'less Shot Gun, 50 & 20

Presses—

Fruit and Jelly—

Enterprise Mfg. Co. 20¢ to 25¢

Seal Presses—

Morrill's No. 1, 10 doz., \$20.00 50¢

Pruning Hooks and Shears

See Shears.

Pullers, Cork—

Invincible Cork Puller \$21.00

Pullers, Nail—

Cyclops 50¢
Miller's Falls, No. 3, 10 doz. \$12.00 33 1/2¢ to 10¢
Morrill's No. 1, Nail Puller, 10 doz. \$20.00 50¢
Pearson No. 1, Cyclone Spike Puller, each \$30.00 50¢
Pelican, 10 doz. \$9.00 40¢ to 10¢
Scranton, Case Lots:
No. 2B (large) \$5.50
No. 3B (small) \$5.00
Smith & Hemenway Co.:
Diamond B. No. 2, case lots 10¢
Diamond B. No. 3, case lots 10¢
Giant No. 1, 10 doz. \$18; No. 2, \$16.50; No. 3, \$15 40¢
Parrot Tack and Stub Puller, 10 doz. 75¢; 10 doz. \$6.00

Pulleys, Single Wheel—

1 in. 1 1/2¢
2 in. 2 1/2¢
3 in. 3 1/2¢
4 in. 4 1/2¢
5 in. 5 1/2¢
6 in. 6 1/2¢
7 in. 7 1/2¢
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30 in. 30 1/2¢
36 in. 36 1/2¢
42 in. 42 1/2¢
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60 in. 60 1/2¢
72 in. 72 1/2¢
84 in. 84 1/2¢
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192 in. 192 1/2¢
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300 in. 300 1/2¢
360 in. 360 1/2¢
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720 in. 720 1/2¢
840 in. 840 1/2¢
960 in. 960 1/2¢
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Thread No. 2, 1/4 in. & up, lb. 54¢
Old Colony Manila Transmission
Rope 17 1/2¢

Wire Rope—

Galvanized 42¢
Plain 50¢

Ropes, Hammocks—

Covert Mfg. Co.: 50¢
Sisal 30¢
Covert Saddlery Works 60¢

Rulers, Desk—

Stimpson & Son: 30¢
Boxwood and Maple 30¢

Rules—

Boxwood 60¢
Ivory 35¢
Chapin-Stephens Co.: 60¢

Boxwood 60¢
Flexifold 27¢
Ivory 35¢
Miscellaneous 50¢
Combination 50¢
Stationers' 10¢

Keuffel & Esser Co.: 35¢
Folding, Wood 35¢
Folding, Steel 35¢

Lufkin's Steel 50¢
Lufkin's Lumber 60¢

Stanley R. & L. Co.: 62¢
Boxwood 45¢
Ivory 60¢

Miscellaneous 60¢
Zig Zag 40¢
Zig Zag, Pin Joint 42¢

Upson Nut Co.: 60¢
Boxwood 35¢

Ivory 35¢

Sash Balances—

See Balance, Sash.

Sash Locks—

See Locks, Sash.

Sash Weights—

See Weights, Sash.

Sausage Stuffers or Fillers

See Stuffers or Fillers, Sausage.

Saw Frames—

See Frames, Saw.

Saw Sets—

See Sets, Saw.

Saw Tools—

See Tools, Saw.

Saws—

Atkins': 50¢

Band 35¢

Cross Cut 35¢

Mulay, Mill and Drag 50¢

One-Man Saw 40¢

Wood Saws 40¢

Hand, Compass, &c. 40¢

Chapin-Stephens 50¢

Turning Saws and Frames 30¢

Diamond Saw & Stamping Works 30¢

Sterling Kitchen Saws 40¢

Liston's:

Circular, Solid and Ins'ted Tooth 50¢

Band, 2 to 1 1/2 in. wide 60¢

Band, 1/4 to 1 in. 60¢

Crosscuts 50¢

Narrow Crosscuts 50¢

Mulay, Mill and Drag 50¢

Framed Woodsaws 35¢

Woodsaw Hacks 35¢

Woodsaw Rods 25¢

Hand Saws, Nos. 12, 9, 9, 16, 4100 25¢

D8, 120, 76, 77, 8 25¢

Hand Saws, Nos. 7, 107, 107 1/2, 3 25¢

0, 0, Combination 25¢

Compass, Key Hole, &c. 25¢

Butcher Saws and Blades 35¢

C. E. Jennings & Co.'s:

Back Saws 25¢

Butcher Saws 25¢

Compass and Key Hole Saws 35¢

Framed Wood Saws 30¢

Hand Saws 20¢

Wood Saw Blades 35¢

Millers Falls:

Butcher Saws 15¢

Star Saw Blade 15¢

Peace & Richardson's Hand Saws 30¢

Simonds':

Circular Saws 50¢

Crescent Ground Cross Cut Saws 35¢

One-Man Cross Cuts 50¢

Gang Mill, Mulay and Drag Saws 50¢

Band Saws 50¢

Back Saws 25¢

Butcher Saws 25¢

Hand Saws 25¢

Compass, Key Hole, &c. 25¢

Wood Saws 35¢

Springfield Mach. Screw Co.: 40¢

Diamond Kitchen Saws 40¢

Butcher Saws Blades 30¢

Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50¢

Hack Saws—

Atkins' Hack Saw Blades A A A 25¢

Diston's:

Concave Blades 25¢

Keystone 40¢

Hack Saw Frames 30¢

Fitchburg File Works, The Best 25¢

C. E. Jennings & Co.'s:

Hack Saw Frames, Nos. 175, 180 40¢

Hack Saws, Nos. 175, 180, complete 40¢

Goodell's Hack Saw Blades 40¢

Griffin's Hack Saw Frames 35¢

Griffin's Hack Saw Blades 35¢

Springfield Mach. Screw Co.: 35¢

Diamond Hack Saw Blades 30¢

Star Hack Saws and Blades 15¢

Sterling Hack Saw Blades 30¢

Sterling Hack Saw Frames 30¢

Scroll—

Barnes' No. 7, 115 25¢

Barnes' Scroll Saw Blades 40¢

Barnes' Velocipede Power Scroll Saw, without boring attachment, \$18 25¢

with boring attachment, \$20 25¢

Lester, complete, \$10.00 15¢

Rogers, complete, \$4.00 15¢

Scalers, Fish—

Covert's Saddlery Works 60¢

Scales—

Family, Turnbull's 50¢

Counter:

Hatch, Platform, 1/2 oz. to 4

lbs. doz. \$5.50

Two Platforms, 1/2 oz. to 8

lbs. doz. \$16.00

Union Platform, Plain \$1.70¢

Union Platform, Stpd. \$1.85¢

Chatillon's:

Eureka 25¢

Favorite 30¢

Crocker Trip Scales 40¢

Chicago Scale Co.:

The "Little Detective" 25¢

Union or Family No. 2 50¢

Portable Platform (reduced list) 50¢

Wagon or Stock (reduced list) 25¢

"The Standard" Portables 50¢

"The Standard" R. R. and Wagon 50¢

Scrapers—

Box, 1 Handle doz. \$2.00¢

Box, 2 Handle doz. \$2.60¢

Ship, Light, \$2.00; Heavy, \$4.50

Adjustable Box Scraper (S. R. & L. Co.) \$6.00

Chapin-Stephens Co. Box 50¢

Screens, Window and

Frames—

Air Line Pattern Screens 60¢

Flyer Pattern Screens 60¢

Maine Screen Frames 40¢

Perfection Screens 60¢

Phillips' Screen Frames 60¢

See also Doors.

Screws—Bench and Hand

Bench, Iron, doz. 1 in. \$2.50¢

2 1/2; 1 1/2, \$3.00¢

Bench, W'd, Beech doz. 30¢

Hand, Wood 30¢

R. Bliss Mfg. Co. Hand 30¢

Chapin-Stephens Co. Hand 30¢

Ohio Tool Co. Bench and Hand 30¢

Coach, Lag and Hand Rail—

Lag, Cone Point, list Oct. 1, '99 75¢

Coach, Gimlet Point, list Oct. 1, '99 75¢

Hand Rail, list Jan. 1, '81 75¢

70¢

Jack Screws—

Standard List 75¢

Millers Falls 50¢

Millers Falls, Roller 50¢

P. S. & W. 50¢

Sargent 70¢

Swett Iron Works 75¢

Machine—

List Jan. 1, '98:

Flat or Round Head, Iron 50¢

Flat or Round Head, Brass 50¢

Set and Cap—

Set (Iron) 80¢

Set (Steel), net advance over Iron 25¢

Sq. Hd. Cap 75¢

Hex. Hd. Cap 75¢

Rd. Hd. Cap 60¢

Fuller Hd. Cap 60¢

Wood—

List July 23, 1903:

Manufacturers' printed discounts:

Flat Head, Iron 87¢

Round Head, Iron 85¢

Flat Head, Brass 85¢

Round Head, Brass 80¢

Flat Head, Bronze 77¢

Round Head, Bronze 75¢

Drive Screws 87¢

Scroll Saws—

See Saws, Scroll.

Scythes—

Prices announced for next season:

Clipper Pattern, Grass 35¢

Full Polished, Clipper 35¢

Grain 30¢

Clipper, Grain 35¢

Weed and Bush 35¢

Seeders, Raisin—

Enterprise 25¢

Sets—Awl and Tool—

Atkins' Seta, Awl and Tools:

No. 20 \$10.00 50¢

Fray's Adj. Tool Handles, No. 1, \$12 50¢

2, \$18; 3, \$12; 4, \$9; 5, \$7 50¢

C. E. Jennings & Co.'s Model Tool 50¢

Holders 30¢

Millers Falls Adj. Tool Handles, No. 1, \$12; No. 4, \$12; No. 5, \$18 15¢

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel 30¢

Octagon 30¢

Ruck Bros 30¢

Cannon's Diamond Point, \$12 25¢

Mayhew's 30¢

Snell's Cannon's Diamond Point 30¢

Snell's Cor'ated, Cup Pt. 30¢

Snell's Curled, Cup Pt. 30¢

Springfield Mach. Screw Co. 30¢

Diamond Knurled Cup Pt. 30¢

Regular list 75¢

Rivet—

Aiken's:

Genuine 50¢

Imitation 50¢

Atkins':

Criterion 40¢

Adjustable 40¢

Bemis & Call Co.'s:

Cross Cut 30¢

Plate 20¢

Diston's Star and Monarch 25¢

Morrill's No. 1, \$15.00 25¢

No. 3 and 4, Cross Cut, \$30.65 50¢

No. 6, Mill, \$30.00 50¢

No. 10, 11, 95¢ 50¢

No. 1, Old Style, \$10.00 50¢

Special \$16.25 50¢

Giant Royal, Cross Cut 50¢

Rival, Hand 50¢

Taintor Positive 50¢

Shaving

Fox Shaving Sets, No. 30 50¢

doz. net, \$21.00

Sharpeners, Knife—

Chicago Wheel & Mfg. Co. 65¢

Shaves, Spoke—

Iron doz. \$1.10¢

Wood doz. \$1.75¢

Razor's (Stanley R. & L. Co.) 45¢

Razor Edge (Stanley R. & L. Co.) 35¢

Chapin-Stephens Co. 30¢

Goodell's 30¢

Wood's Fl and F2 50¢

Shears—

Cast Iron 7 8 9 in.

Best \$16.00 18.00 20.00 gro.

Good \$13.00 15.00 17.00 gro.

Cheap \$5.00 6.00 7.00 gro.

Straight Trimmers, &c.:

Best quality, Jap. 70¢

Best quality, Nickel 60¢

Fair quality, Jap. 80¢

Fair quality, Nickel 75¢

Oil Stones, &c.—	
Chicago Wheel & Mfg. Co. 1901 list:	
Gem Corundum Oil, Double Grit, 50%	
Gem Corundum Oil, Single Grit, 50%	
Double Grit, 50%	
Gem Corundum Slips, 50%	
Pike Mfg. Co., 1901 list:	
Arkansas St. No. 1, 3 to 5 in. 3.50	
Arkansas St. No. 1, 5 to 8 in. 3.50	
Arkansas Slips No. 1, 4 to 8 in. 4.00	
Lily White Washita, 4 to 8 in. 4.00	
Rosy Red Washita, 4 to 8 in. 4.00	
Washita St., Extra, 4 to 8 in. 4.00	
Washita St., No. 1, 4 to 8 in. 4.00	
Washita St., No. 2, 4 to 8 in. 4.00	
Lily White Slips, 4 to 8 in. 4.00	
Rosy Red Slips, 4 to 8 in. 4.00	
Washita Slips, Extra, 4 to 8 in. 4.00	
Washita Slips, No. 1, 4 to 8 in. 4.00	
Washita Slips, No. 2, 4 to 8 in. 4.00	
India Oil Stones (entire list) 3.50	
Quickcut Emery and Corundum Oil	
Stone, Double Grit, 3.50	
Quickcut Emery and Corundum Oil	
Stone, Double Grit, 3.50	
Quickcut Emery Rubbing Bricks, 3.50	
Hindustan No. 1, R. G. lar. 10 lb 8	
Hindustan No. 1, Small, 10 lb 8	
Axe Stones (all kinds) 2.50	
Turkey Oil Stones, Extra, 4 to 8 in. 4.00	
Queer Creek Stones, 4 to 8 in. 4.00	
Queer Creek Slips, 4 to 8 in. 4.00	
Sand Stone, 4 to 8 in. 4.00	
Belgian, German and Swaty Razor	
Hones, 4 to 8 in. 4.00	
Natural Grit Carving Knife	
Hones, 4 to 8 in. 4.00	
Quick Edge Pocket Knife	
Hones, 4 to 8 in. 4.00	
Mounted Kitchen Sand Stone, 4 to 8 in. 4.00	

Stoners, Cherry—

Enterprise 50¢ doz. 50%

Stoppers, Bottle—

Victor Bottle Stoppers, 50¢ doz. 50%

Stops—Bench—

Millers Falls, 15¢ doz. 15%

Morrill's, 10¢ doz. No. 1, 10.00 50%

Morrill's, No. 2, 12.50 50%

Door—

Chapin-Stephens Co., 60¢ doz. 60%

Plane—

Chapin-Stephens Co., 20¢ doz. 20%

Straps—Box—

Cary's Universal, case lots, 20¢ doz. 20%

Hame—

Covert's Saddlery Works, 60¢ doz. 60%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60¢ doz. 60%

Socket, 60¢ doz. 60%

Excelsior Stretcher and Tack Hammer Combined, 50¢ doz. 50%

Stuffers, Sausage—

Enterprise Mfg. Co., 20¢ doz. 20%

National Specialty Co., list Jan. 1, 1902 30¢ doz. 30%

Sweepers, Carpet—

National Sweeper Co., 30¢ doz. 30%

Auditorium, Roller Bearing (30 in. case), Nickel, 30¢ doz. 30%

Mammoth, Roller Bearing (30 in. case), Nickel, 30¢ doz. 30%

Marion, Roller Bearing, regular finishes, full Nickel, 30¢ doz. 30%

Marion Queen, Roller Bearing, full Nickel, 30¢ doz. 30%

Monarch, Roller Bearing, N'kel, 30¢ doz. 30%

Monarch, Roller B'g, Jap'ned, 30¢ doz. 30%

Transparent, Roller Bearing, Plate Glass Top, Nickel, 30¢ doz. 30%

Monarch Extra, Roller Bearing, (17-in. case), Nickel, 30¢ doz. 30%

Monarch Extra, Roller Bearing, (17-in. case), Japanned, 30¢ doz. 30%

National Queen, Fancy Veneer, 30¢ doz. 30%

Perpetual, Regular B'g, Jap. 30¢ doz. 30%

Triple Medal, 30¢ doz. 30%

NOTE—Rebates: 50¢ per dozen on three-dozen lots; \$1 per dozen on five-dozen lots; \$2 per dozen on ten-dozen lots; \$3 per dozen on twenty-five-dozen lots.

Tacks, Finishing Nails, &c.

New List, May 1, 1905.

American Carpet Tacks, 50¢ doz. 50%

American Cut Tacks, 50¢ doz. 50%

Suedes Cut Tacks, 50¢ doz. 50%

Suedes Upholsterers' Tacks, 50¢ doz. 50%

Gimp Tacks, 50¢ doz. 50%

Lace Tacks, 50¢ doz. 50%

Trimmers' Tacks, 50¢ doz. 50%

Looking Glass Tacks, 50¢ doz. 50%

Bill Posters' and Railroad Tacks, 50¢ doz. 50%

Hungarian Nails, 50¢ doz. 50%

Finishing Nails, 50¢ doz. 50%

Trunk and Clout Nails, 50¢ doz. 50%

NOTE—The above prices are for Standard Weights. An extra 5¢ is given on Medium Weights, and an extra 10¢ on Large Weights.

Miscellaneous—

Double Pointed Tacks, 50¢ doz. 50%

Steel Wire Brads, R. & E. Mfg. Co., list 50¢ doz. 50%

See also Nails, Wire.

Tanks, Oil—

Emerald, S. S. & Co., 30-gal. 30.40

Emerald, S. S. & Co., 20-gal. 24.25

Queen City, S. S. & Co., 30-gal. 33.65

Queen City, S. S. & Co., 20-gal. 24.50

Tapes, Measuring—

American Asses' Skin, 50¢ doz. 50%

Patent Leather, 50¢ doz. 50%

Steel, 50¢ doz. 50%

Chesterman's, 50¢ doz. 50%

Eddy Asses' Skin, 50¢ doz. 50%

Eddy Patent Leather, 50¢ doz. 50%

Eddy Steel, 50¢ doz. 50%

Keuffel & Esser Co.:	
Favorite, Ass Skin, 40¢ doz. 40%	
Favorite, Duck and Leather, 40¢ doz. 40%	
Metallic and Steel, lower list, 40¢ doz. 40%	
Pocket, 40¢ doz. 40%	
Lufkin's:	
Asses' Skin, 40¢ doz. 40%	
Metallic, 40¢ doz. 40%	
Patent Bend, Leather, 40¢ doz. 40%	
Pocket, 40¢ doz. 40%	
Steel, 40¢ doz. 40%	

Teeth, Harrow—
Steel Harrow Teeth, plain or headed, 1/2-inch and larger, per 100 lbs. \$3.00

Thermometers—

Tin Case, 80¢ doz. 80%

Ties, Bale—Steel Wire—

Single Loop, 80¢ doz. 80%

Monitor, Cross Head, do., 70¢ doz. 70%

Brick Ties—

Niagara Brick Ties, 25¢ doz. 25%

Tinners' Shears, &c.—

See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works, 40¢ doz. 40%

Tire Benders, Upsetters, &c.—

See Benders and Upsetters, Tire.

Tools—Coopers'—

L. & I. J. White, 20¢ doz. 20%

Hay—

Myers' Hay Tools, 50¢ doz. 50%

Stowell's Hay Carriers, 50¢ doz. 50%

Stowell's Hay Forks, 50¢ doz. 50%

Stowell's Fork Pulleys, 50¢ doz. 50%

Saw—

Atkins' Cross Cut Saw Tools, 40¢ doz. 40%

Simonds' Improved, 30¢ doz. 30%

Simonds' Crescent, 25¢ doz. 25%

Ship—

L. & I. J. White, 25¢ doz. 25%

Transom Lifters—

See Lifters, Transom.

Traps—Fly—

Balloon, Globe or Acme, doz. \$1.15 (\$1.25; gro. \$1.50) (\$2.00

Harper, Champion or Paragon, doz. \$1.25 (\$1.40; gro. \$1.50) (\$3.00) (\$3.50

Game—

Oncida Pattern, 75¢ doz. 75%

Newhouse, 45¢ doz. 45%

Hawley & Norton, 65¢ doz. 65%

Victor and Oncida, 70¢ doz. 70%

O. C. Jump (Blake Pat.), 65¢ doz. 65%

Mouse and Rat—

Mouse, Wood, Choker, doz. 85¢ doz. 85%

Mouse, Round or Square Wire, doz. 85¢ doz. 85%

Marty French Rat and Mouse Traps (Genuine), doz. 85¢ doz. 85%

No. 1, Rat, each \$1.21; 10 doz. \$13.25

No. 3, Rat, 10 doz. \$13.25; case of 50 \$75.00

No. 3 1/2, Rat, 10 doz. \$13.25; case of 50 \$75.00

No. 4, Mouse, 10 doz. \$13.25; case of 50 \$75.00

No. 5, Mouse, 10 doz. \$13.25; case of 50 \$75.00

No. 5 1/2, Mouse, 10 doz. \$13.25; case of 50 \$75.00

Trimmers, Spoke—

Wood's E I., 50¢ doz. 50%

Trowels—

Diston Brick and Pointing, 30¢ doz. 30%

Diston Plastering, 25¢ doz. 25%

Diston "Standard Brand" and Garden Trowels, 30¢ doz. 30%

Kohler's Steel Garden Trowels, 5 in. 30¢ doz. 30%

Kohler's Steel Garden Trowels, 6 in. 30¢ doz. 30%

Never-Break Steel Garden Trowels, 30¢ doz. 30%

Rose Brick and Plastering, 25¢ doz. 25%

Woodrough & McParlin, Plastering, 25¢ doz. 25%

Trucks, Warehouse, &c.—

B. & L. Block Co., 50¢ doz. 50%

New York Pattern, 50¢ doz. 50%

Western Pattern, 50¢ doz. 50%

Handy Trucks, 50¢ doz. 50%

Grocery, 50¢ doz. 50%

Day Store Trucks, Improved Pattern, 50¢ doz. 50%

McKinney Truck, 50¢ doz. 50%

Model Store Trucks, 50¢ doz. 50%

Tubs, Wash—No. 1 2 3

Galvanized, per doz. \$1.50 5.00 5.75

Galvanized Wash Tubs (S. S. & Co.), No. 1 2 3 10 20 30

Per doz., net \$3.70 \$3.30 \$3.20 \$3.10 \$3.00

Twine, Miscellaneous—

Flax Twine: B. C. B.

No. 9, 1/4 and 1/2-lb. Balls, 22¢ doz. 22%

No. 12, 1/4 and 1/2-lb. Balls, 18¢ doz. 18%

No. 18, 1/4 and 1/2-lb. Balls, 16¢ doz. 16%

No. 24, 1/4 and 1/2-lb. Balls, 16¢ doz. 16%

No. 36, 1/4 and 1/2-lb. Balls, 15¢ doz. 15%

Chalk Line, Cotton 1/2-lb. 30¢ doz. 30%

Cotton Mops, 6, 9, 12 and 15 lb. 10¢ doz. 10%

Cotton Wrapping, 5 Balls to lb., according to quality, 13¢ doz. 13%

American 2-Ply Hemp, 1/4 and 1/2-lb. Balls, 13¢ doz. 13%

American 3-Ply Hemp, 1-lb. Balls, 13¢ doz. 13%

India 2-Ply Hemp, 1/4 and 1/2-lb. Balls (Spring Twine), 13¢ doz. 13%

India 3-Ply Hemp, 1-lb. Balls, 13¢ doz. 13%

India 3-Ply Hemp, 1 1/2-lb. Balls, 13¢ doz. 13%

2, 3, 4 and 5-Ply Jute, 1/2-lb. Balls, 10¢ doz. 10%

Mason Line, Linen, 1/2-lb. Bls. 4¢ doz. 4%

No. 26 1/2 Mattress, 1/4 and 1/2-lb. Balls, 3¢ doz. 3%

Wool, 3 to 6 ply, B 4 1/2; A 5¢ doz. 5%

Vises—

Solid Box, 60¢ doz. 60%

Parallel—

Athol Machine Co., 40¢ doz. 40%

Simpson's Adjustable, 40¢ doz. 40%

Standard, 40¢ doz. 40%

Amateur, 25¢ doz. 25%

Columbian Hdw. Co., 40¢ doz. 40%

Emmett Universal, 40¢ doz. 40%

Pattern Makers' No. 1, \$15.00; No. 2, \$12.50; No. 3, \$10.00.

Machinist and Tool Makers' No. 4, \$12.50; No. 5, \$7.00; No. 6, \$10.00.

No. 10, \$21.50.

Jewellers' No. 7, \$4.00

Fisher & Norris Double Screw, 15¢ doz. 15%

Hollands: 40¢ doz. 40%

Machinists' 40¢ doz. 40%

Keystone 65¢ doz. 65%

Lewis Tool Co., 20¢ doz. 20%

McCall's 20¢ doz. 20%

Miller's 20¢ doz. 20%

Almasey Vise Co., 40¢ doz. 40%

Clincher 40¢ doz. 40%

Perfect 20¢ doz. 20%

Lightning Grip, 20¢ doz. 20%

Pariser's 20¢ doz. 20%

Victor 20¢ doz. 20%

Regulars 20¢ doz. 20%

Vulcan 40¢ doz. 40%

Combination Pipe, 50¢ doz. 50%

Wymann & Gordon's Quick Action, 20¢ doz. 20%

Sargent's 40¢ doz. 40%

Smith & Hemenway Co., 40¢ doz. 40%

Machinists' 40¢ doz. 40%

Jewellers' 30¢ doz. 30%

Snediker's X. L., 30¢ doz. 30%

Stephens' 30¢ doz. 30%

Williamson Mfg. Co. Double Swivel, 40¢ doz. 40%

Saw Filers—

VOLUME
TIGHTLY BOUND
BEST COPY
AVAILABLE